

June • 1951

finish

Metal Products Manufacturing

FROM RAW METAL TO FINISHED PRODUCT

AN INVOICE RECEIVED

from "CERAMIC" COLOR



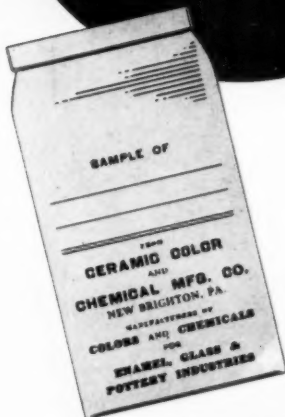
CREATES INVOICES RECEIVABLE

from SATISFIED CUSTOMERS



*To meet your
Enamel needs*

- Color Oxides
- Screening Colors
- Smelter Color Compounds
- Printing, Graining, Stamping,
- Banding, and Decal Colors



CONVINCING EVIDENCE

"Ceramic" is devoting its experience and extensive laboratory and processing equipment to testing and converting available material into usable products.

If you desire a sample to assure you that "Ceramic" standards of quality are being maintained and that materials shipped will stand the test in actual production, it will be cheerfully furnished.

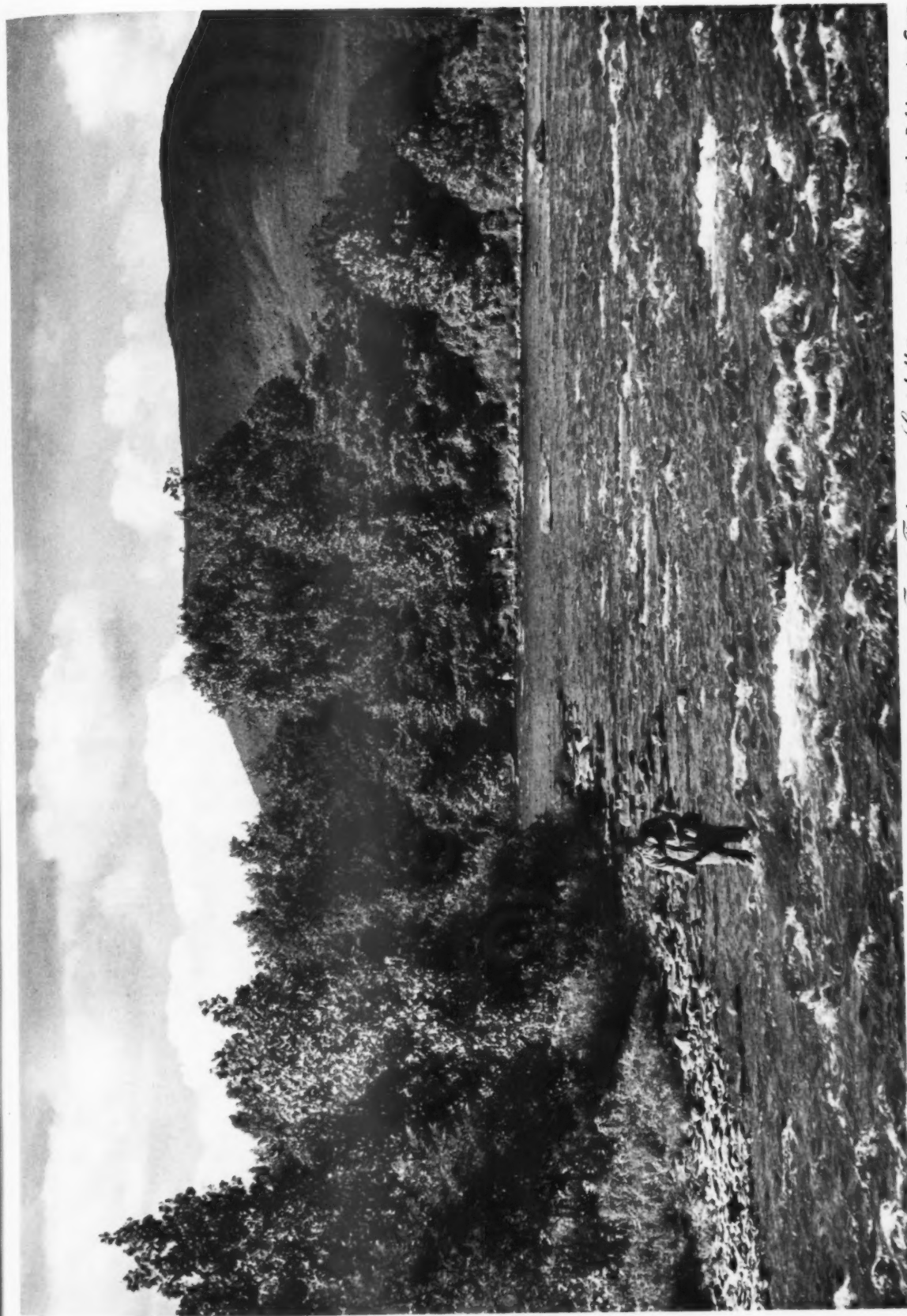
● Colors and chemicals you can count on . . . for true color match . . . for trouble-free accommodation to your production routine . . . have a lot to do with the reduction of rejects and making outgoing invoices check closely with the materials you pay for.

Regardless of present or future shortages or controls, you can continue to count on "Ceramic" for consistent quality, because . . . every "Ceramic" color will be processed and tested under conditions simulating actual production, and every "Ceramic" chemical will be checked for chemical purity, before shipment is made.

During the last period of shortages we established a policy which will still be maintained . . . we recognize our responsibility to those customers who have depended on us for their requirements, and we will bend every effort to see that their wants are supplied.

CERAMIC COLOR & CHEMICAL MFG. CO.
New Brighton, Pa., U.S.A.





Camera: $3\frac{1}{4}$ x $4\frac{1}{4}$ Speed Graphic; Orange Filter (G)
Film: Super Panchro Press, Type B — $1/100$ sec. at f/11

"Fruit Fishing in Cabbages" by H. C. Sollman, Harder Refrigerator Corp.

TEN DOLLARS will be paid for good quality black on white 8x10 enlargement chosen for this page. Sports subjects or plant operations given preference.

This fabricated Inconel burning tool, made by Ferro Enamel Corp., Cleveland, Ohio, is one of a group that saved one washing machine manufacturer \$127.68 in fuel costs, alone, every week.



Look at the 4-WAY SAVINGS possible with fabricated Inconel burning tools

Fabricated burning tools are lighter. This fact, plus the excellent heat-resisting properties of wrought burning tool alloys, give users these four *plus* advantages:

1. Lower Fuel Costs—

Take, for example, Inconel® Burning Tools fabricated by the Ferro Enamel Corporation, Cleveland, Ohio, for the washing machine industry. The tools weigh only 8 to 12 pounds—12 to 14 pounds less than the tools they replaced. *In one furnace alone, one user reported lighter tools saved \$127.68 in fuel costs per week!*

2. Increased Furnace Production

—Because of the less bulky construction, these tools permit increased furnace loading. They have enabled some plants to double-deck their tubs through the furnaces... *thus gaining greatly increased furnace capacity.*

3. Fewer Rejects—

Burning tools of Inconel are highly

resistant to spalling. With proper care, there is little possibility of scale damaging the finishes of the pieces being enameled.

4. Lower Maintenance Costs—

Fabricated Inconel burning tools are inexpensive to maintain, and replacements are fewer. That's because tough, heat-resistant Inconel equipment gives thousands of trouble-free service hours at temperatures as high as 2000°F.

Due to increased defense production, output of INCO Nickel Alloys is being increasingly diverted to military needs and government stockpiles. But remember, Inco's Engineers are always ready to help you solve your metal problems, either for present defense needs, or for future installations.

To see how fabricated equipment has saved costs in many high-temperature applications, write for your free copy of "Keep Operating Costs Down When Temperatures Go Up."



THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

INCONEL . . . for long life at high temperatures

Cruel TEST OF TIME

In observance of our Fiftieth Anniversary, we show you here a few examples of the way Ing-Rich porcelain enamels have withstood the cruel test of time. Surely there can be no better proof of the basic high quality of both materials and workmanship.

During the fifty years of our corporate existence, there have been many opportunities and temptations to chisel a little here and there, to weather business depressions by compromising with quality of product. To the credit of those gentlemen who guided this company's destinies in earlier years, and to those now at the helm, we can proudly say that no such course has ever been taken. When you buy PORCELFRIT you get an *honest* product, made as expertly, from as fine materials, as you can possibly procure anywhere.

The big advantage to you is that in PORCELFRIT you also get a *plant-tested* product. We use it just as you use it, right here in our own job enameling department. It comes to you with the guesswork removed . . . with it you can turn out porcelain enamels that will stand up just as the samples shown here have done. Turn out beautiful porcelain enamels that *stay* beautiful — specify PORCELFRIT.



Ing-Rich made this license plate in 1907. For many years after it had been used on the owner's car, it lay around in his garage. It is still in perfect condition, and the porcelain enamel is just as bright as it was when the plate left the enameling furnace in 1907.

50th

ANNIVERSARY

INGRAM-RICHARDSON, INC.
OFFICES, LABORATORY AND PLANT
FRANKFORT, INDIANA, U. S. A.

for Clarification of NICKEL DIP SOLUTIONS NEUTRALIZING SOLUTIONS

use an
**INDUSTRIAL
Filter**

Any Quantity

100 to 15,000 gallons per hour.
Portable and stationary models.
Standard or special filtration
systems engineered to meet
unusual requirements.

**Dependable
clarification pays...**



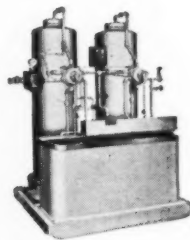
Here's how Industrial filters simplify clarification problems—The flow rates of Industrial filters are based on the actual solution involved. You know the capacity you get. In solution clarification there is more than just the filter. With Industrial you get an adequate filter with slurry tank, motor-driven pump, valves and fittings in a complete package with one, undivided, experienced responsibility—with space requirements at a minimum.

The labor, down time, and the inconveniences of cleaning, replacing the filter media, and reassembling the filter for every new filter cycle—all are eliminated by the Industrial Air-Wash Cleaning Method available for all models. It is necessary to remove the cover only when new filter cloths are installed. With Industrial filters, a clarified plating solution is always assured.

The engineering, design, and construction of Industrial filters have proved out in long service and low maintenance costs. Industrial has the experience and is large enough to handle your filter requirements. Since 1927 filters and filtration systems have been an important part of our business.

**INDUSTRIAL
Water
Demineralizers**

for Mill room assurance
that the slip is
always right



A Two-Bed INDUSTRIAL Water Demineralizer.
Standard two-and four-bed units available with
capacities of 200 to 1000 gph. Special units of any
capacity engineered to requirements.

Write for full information
and recommendations

INDUSTRIAL FILTER & PUMP MFG. CO.

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Chicago 50, Illinois

FILTERS	PUMPS	CORROSION TESTING APPARATUS
Pressure Type	Centrifugal	Salt Fog • Humidity
RUBBER DIVISION		
Vulcanized Linings • Molded Products		
WATER		
DEMINERALIZERS		

From the Editor's mail..

"fine coverage of PMI meeting"

Gentlemen:

I have just read your account of the PMI Technical Meeting, held in March, and I want you to know how much I, personally, appreciate the fine coverage which you have continuously given the Pressed Metal Institute.

The Institute is growing steadily, and I was particularly pleased to see names of men from Maytag and other companies in the list who, by their attendance, placed value on the information which they received from these technical meetings sponsored by PMI. Much credit must be given Ben Werntz and his staff for the efficient and effective program which they put on.

Again, let me express my appreciation as President of the Institute this year.

Howard C. Wolf
Assistant to President
Mullins Manufacturing Corp.
Salem, Ohio

"our paper in print so beautifully"

Gentlemen:

With many thanks I have just received three copies of April *finish*, and have been so filled with joy seeing that our paper "Studies on Fish-scale of Porcelain Enamel" is in print so beautifully. Immediately I gave one copy to Dr. Megumi Tashiro, my assistant professor, and have sent one to Mr. Tadashi Yasui. Mr. Tashiro was so delighted by finding out his name in so famous a journal as *finish*.

I am very much pleased for your kind arrangements that our article appeared in the April issue, when the annual meeting of the American Ceramic Society was held in Chicago, and on page 41 you kindly referred to the title of our paper in connection with this event.

Now we are working actively to solve the problems of porcelain enamel for use at high temperatures, and if you could give us another opportunity for publishing our papers in *finish*, I shall be very much appreciative.

Ikutaro Sawai
Professor of Ceramics
Kyoto University
Kyoto, Japan

KEMCLAD
HEETCLAD

KEMVAR

SUPERCLAD

TV LACQUER

DIMENSO



G. L. Hehl, General Manager,
General Industrial Division.

**"If the label says KEMVAR
it will be KEMVAR!"**

A statement of policy to users of
Sherwin-Williams Industrial Finishes . . .

...for CIVILIAN production:

"To aid manufacturers in protecting and maintaining their finishing standards, Sherwin-Williams makes this statement of policy:

"Restrictions in the supply of some of the quality ingredients of such well-known, standard Sherwin-Williams industrial finishes as Kemvar, Kemclad and others may affect the *quantity* of such finishes that can be supplied.

"So long as these branded finishes can be supplied at all, however, no deviation in their *quality* will be permitted.

"Users of such finishes can therefore be assured that if a label *says* KEMVAR, the material so labeled will *be* KEMVAR, as nearly unvarying in established performance characteristics, both on the production line and afterwards, as strict quality control can make it."

...for DEFENSE production:

"The same integrity of product and appreciation of practical production problems is assured to users of Sherwin-Williams finishes for defense order production as for their civilian requirements.

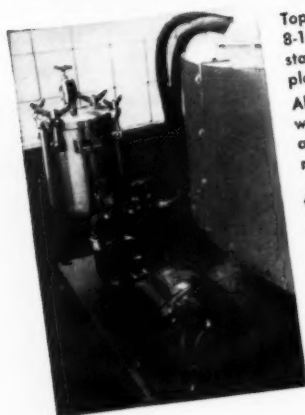
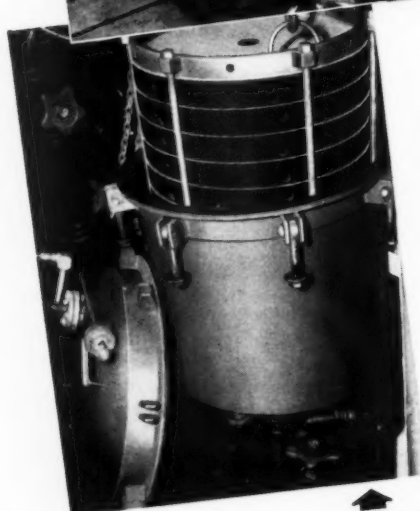
"Every effort will be made by Sherwin-Williams finish technicians to furnish defense manufacturers with suggestions for making necessary change-overs to meet government finishing specifications accurately in spirit as well as letter, with least possible modifications of existing equipment."

Sherwin-Williams background of experience extending through two World Wars will be made available on any defense production problems, through facilities extending from coast to coast. Call, wire or write The Sherwin-Williams Co., 101 Prospect Avenue, Cleveland 1, Ohio.

SHERWIN-WILLIAMS
INDUSTRIAL FINISHES



**No repairs or maintenance
in over 17,000 hours of
'round-the-clock operation**



Top: Sparkler Model 8-18 filter shown installed in Gillette's plating department.
Above: Same filter, with filter plate assembly being removed for cleaning

Left: Sparkler Model 8-6 stainless steel filter. This portable unit is used by Gillette to filter gold plating solutions.

**... yet this
SPARKLER
Horizontal Plate
FILTER
is still going strong**

The kind of service Sparkler Horizontal Plate Filters have given the Gillette Safety Razor Company—efficient and trouble-free, even under most extreme conditions—is the kind of service that is vital to every filtering operation.

For example: A rubber-lined Sparkler Model 8-18 filter is used by Gillette in the continuous filtration of a 1000-gallon bright nickel plating solution. Now operating for approximately two years, this filter has been on a 24 hours a day, 7 days a week schedule—without any loss of operating time for repairs or maintenance. Also used in periodic batch carbon treatments of nickel solutions this unit, according to Gillette technicians, consistently delivers a brilliantly clear effluent, even though the plates may be packed solid.

Another Sparkler Filter employed by Gillette is a Model 8-6, stainless steel, portable unit. Used exclusively for cyanide type plating solutions, this Model 8-6 has proved particularly valuable for Gillette's gold plating operations since the patented Sparkler Scavenger Plate assures minimum loss of precious gold solution. Now operating almost six months for at least 2 hours daily, its performance has been satisfactory in every respect.

Our Engineering Department (with more than 25 years' experience in every phase of filtration) is available for consultation without charge.

SPARKLER MANUFACTURING CO.
MUNDELEIN, ILLINOIS

MEETINGS

STOVE MEETING, JUNE 4 - 6

The 19th annual convention and exhibit of the Institute of Cooking and Heating Appliance Manufacturers will be held at the Netherland Plaza, Cincinnati, June 4, 5 and 6.

WEST COAST ENAMELERS, JUNE 8

The next meeting of the Pacific Coast Enamelers Club will be held Friday evening, June 8, at Andary's Restaurant, Maywood, Calif.

AHLMA MEETING, JUNE 16

The summer meeting of the American Home Laundry Manufacturers will be held in Chicago, June 16, just preceding the opening of the Summer Homefurnishings Market.

CHEMICAL INSTITUTE MEETING

The annual conference of The Chemical Institute of Canada will be held in Winnipeg, Manitoba, June 18, 19 and 20.

HOMEFURNISHINGS MARKET

The Summer Homefurnishings Market will be held in Chicago, June 18 through 23, at The Merchandise Mart and the American Furniture Mart.

TRUCKERS TO DISCUSS

SAFE TRANSIT, JUNE 20

At the annual Shipper-Carrier-Receiver meeting of the American Trucking Associations at Fort Shelby Hotel, Detroit, June 20, a special session will be devoted to the National Safe Transit Program (details on page 83).

ELECTROPLATERS MEETING

The American Electroplaters Society will hold its annual convention in Buffalo, N. Y., at the Statler Hotel, July 30 through August 2.

JUNE • 1951 finish

A continuous conveyor operation for production of Army clothes lockers

by *B. A. Nagelvoort* • PRESIDENT, RENOWN STOVE COMPANY, OWOSSO, MICHIGAN



DEFENSE
PRODUCTION
FEATURE

Early this year we completed the necessary tooling for the mass production of steel clothes lockers for the Army. Today, these lockers, which use up 400 tons of steel a month, are coming off the assembly line at the rate of 550 per day.

Every production operation is mechanized for speed and efficiency, and is as nearly automatic as possible. There is no waste motion in any operation from the time the steel leaves

our receiving dock until the finished lockers are crated for shipment.

Our operation is unique in that all the ware is handled on a continuous overhead monorail conveyor right off the stamping presses, through metal cleaning, painting, baking and cooling — until the parts are ready for crating.

Fabrication procedure

From the receiving dock the steel is carted to three different-sized power shears. After cutting to desired widths and lengths, the steel sheets, from which the tops, bottoms and shelves for the lockers are stamped out, are

taken to a press with a four-stage progressive die. Backs and sides are punched and formed on a second press.

Punching and forming operations on the doors are performed on a 100-ton press. Louvres are then notched in the front door, door edges are formed, and corners are welded. The front frame parts move on to spot welders who weld the top and bottom channels, side frame angles, hinges, lock clips and catches. Then the front frames and front doors are placed on separate roller conveyor lines which meet at a point where the frames and doors are assembled.

The locker parts are then hung on

Blanking, notching, punching and forming operations on top, bottom and shelf sections of lockers are performed with this press.



PHOTOS COURTESY THE OWOSSO
ARGUS-PRESS

apls mnt
finish JUNE • 1951



Spot welding front frame assemblies—2 side frames, 2 top and bottom channels, 3 lock catches and 3 hinges.



Spraying lower half of back sides of locker parts an olive green baking enamel.

a 710-foot-long overhead monorail conveyor which takes them through an oven at 600° F. to burn off any oil or sludge residue on the sheets.

Locker parts sprayed with an olive green paint

This continuous conveyor carries parts on through water-wash paint

spray booths for the application of olive green paint.

Sprayers at different levels

Our spraying technique differs from the usual practice in that we have sprayers at high and low elevations in each of two spray booths, and in that we have one set of operators spray

one side of the ware, and another set of operators spraying the opposite side.

Pump delivers paint from storage to spray booths

Drums of ready-mixed paint are stored in a fire-proof room. A paint delivery pump is used to feed the

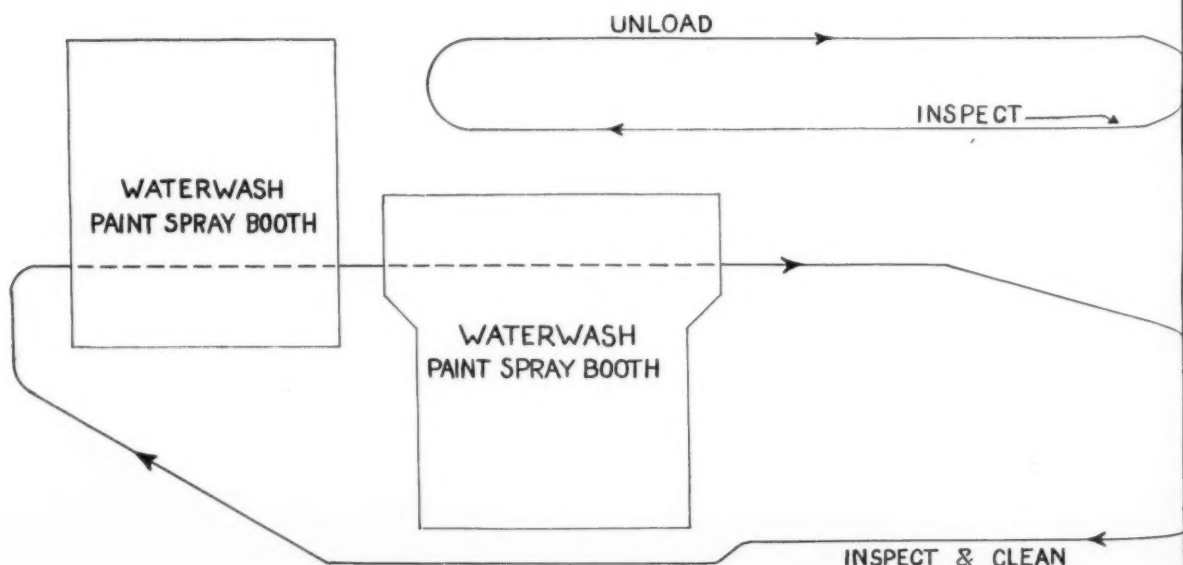
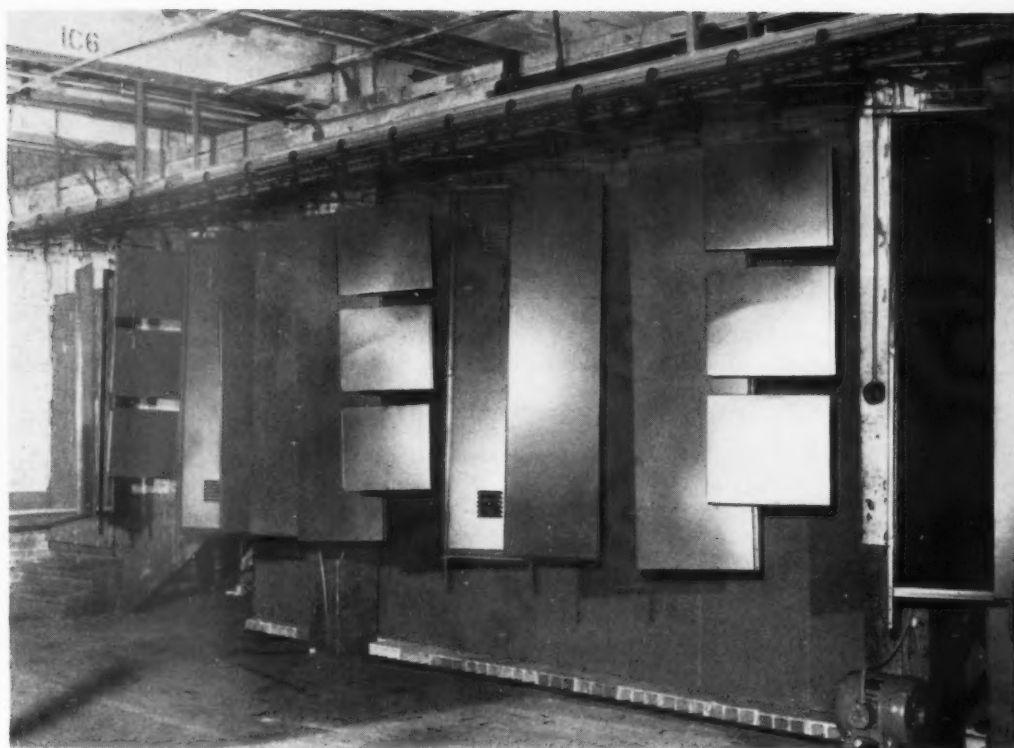


Photo shows locker parts on the cooling line after leaving baking oven, and on way to the unloading and packing station.



paint through lines from this room to the spray guns. The paint is constantly agitated in the drums to maintain top quality.

From the spray booths, the parts are taken on a 13-minute trip through a bake oven where the paint is cured at a temperature of 325° F. From this oven, the ware continues on the

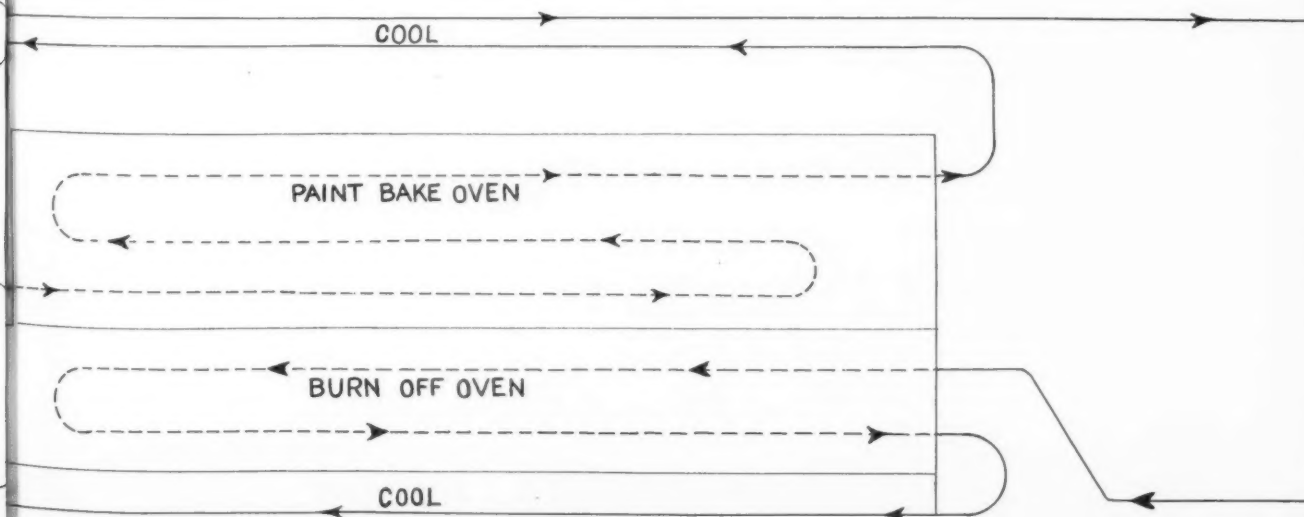
conveyor through a cooling area to the unloading station.

Locker parts crated and shipped to QM depots

As the parts are removed from the lines, they are packed in sets in wooden crates and prepared for shipment (for photo showing crating op-

erations at Renown Stove, turn to page 67). Shipment may be in two different ways: three single lockers to a box, or a battery of five to a box.

A fork lift truck then transports the crates to the loading dock where they are shipped to various Quartermaster Depots around the country.



...replaces Chlorinated Solvent Degreasers

We have worked out a cleaning process for all metals in our laboratories that utilizes emulsion cleaners of the W/O type, based on petroleum products, to replace hot chlorinated solvent degreasing. In effect, this system is equivalent to spraying the work with solvent, while immersed in water, rather than in air. Since these emulsions are characteristically unstable, mechanical agitation is required to maintain dispersion of the solvent in the water phase. This agitation may be induced by propeller type mixers or by a pump-and-jet system. Both are effective and engineering details are available. The two-phase bath is built up of petroleum solvent procured at low cost by the user and treated with a small proportion of Northwest Addition Agent # 230. The two-phase bath can also be prepared by adding directly to the

water, 5% to 20% Northwest Emulsion Cleaner # 3. These baths may be heated to the maximum of 160° F., depending upon the solvent used. In some cases the agitation may be dispensed with, but in all cases the two-phase precleaning must be followed by a thorough spray rinse. This rinse has a unique cleaning effect in conjunction with a displacement film deposited on the metal in the emulsion pre-cleaner. This film is extremely thin and invisible, but is essential to the complete removal of microscopic particles of foreign matter (smut) . . . Parts are carried on racks throughout the operation . . . the process is adaptable to the smallest shop or the largest plant, automatic or manual handling. . . . let our technicians consult with you.

LO^{PH}

NORTHWEST CHEMICAL CO.
9310 ROSELAWN DETROIT 4, MICH.

pioneers in pH cleaning control — serving you since '32

New plating process gives bright finish

a new method of plating saves nickel — may save bright appliance trim

A NEW method of metal plating may conserve critical nickel and still provide the nation's appliances and other metal products with bright, corrosion-resistant trim.

George W. Jernstedt, manager of electroplating projects, Westinghouse Electric Corporation, Pittsburgh, Pa., said the new technique—called periodic reverse-current plating (PR plating)—can be applied easily to toasters, irons, tubular furniture, auto bumpers, door handles, radiator grilles, and body trim.

"Where no nickel at all is permitted, such as on appliances and auto trim," he disclosed, "the new process provides a chrome-on-copper finish that is as bright as the standard finish and has satisfactory corrosion resistance.

"In other cases where some nickel is permitted—auto bumpers for example—PR plating makes it possible to substitute copper for a major part of the nickel normally used, thus achieving a big savings of this critical material."

Jernstedt said that "Westinghouse has been using the process for more than a year in electroplating its appliances. Now, several automobile manufacturers and suppliers are adopting it for use on many types of auto parts and accessories.

"Using the Westinghouse system," he said, "a layer of copper—about one-thousandth of an inch thick—is plated onto the steel base. If nickel is allowed, we then add a layer about one-half the thickness of the copper layer. The coating is completed with a film of chrome that may be less than 1/100,000th of an inch thick. Before nickel was put on the critical list, the conventional method was to plate the steel first with nickel and then chrome.

"Although not as scarce as nickel, copper is also a critical material,"

Jernstedt pointed out. "But the new plating system," he added, "requires only small quantities—much less than for other metal substitutes proposed. In addition, many hundreds of thousands of gallons of copper-plating solution already are available for use.

Key feature of system

"The key feature of the new plating system is the periodic reversal of short duration of the plating current. This alternately deposits metal on the surface to be plated, then during the reversal, takes some of it away. Continuation of this cycle builds up a plate quality superior to anything previously obtained from straight, unreversed direct current. In effect, the PR system makes it possible both to improve surface smoothness and brightness, and to enhance the body quality of the deposit.

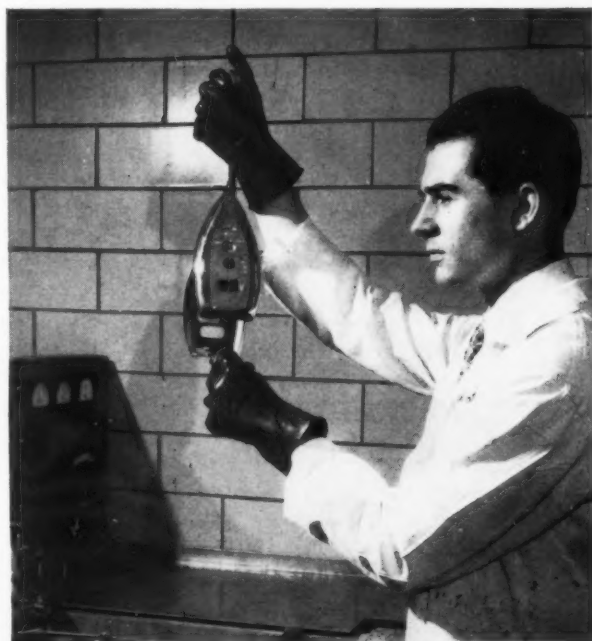
"In the copper plating process, the piece to be plated is placed in a bath containing copper in a cyanide solution. When electric current is passed

through this bath, copper is deposited on the metal piece—which forms the negative terminal of the system—and dissolved into the bath from a copper electrode which is the positive terminal.

"Then, after less than a minute, the current is reversed. As a result, some of the copper already plated on the metal part is dissolved. This cycle is repeated until a satisfactory finish is achieved. Each time the current is reversed, inferior metal deposits are removed from the surface, and succeeding layers are always plated on sound metal to produce a finish that has superior brightness, strength, and freedom from flaws.

"Direct-current methods of electroplating tend to produce surfaces that under a microscope appear lumpy, nicked, and with imperfectly rounded corners. But the new PR process fills in the 'valleys' and smooths out the 'peaks' of the surface by alternately giving and taking away metal," concluded Jernstedt.

The bright finish on this cover for an electric hand iron was attained with the new plating technique.



WHATEVER YOUR PRODUCT
FINISHING PROBLEMS . . .

AMERICA'S LEADING APPLIANCE MANUFACTURERS RELY ON

Nubelite



GLIDDEN-NUBIAN

IS READY TO HELP YOU!

*in OUR Laboratory
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AT THE I. C. H. A. M. CONVENTION . . . SEE US AND MEET YOUR FRIENDS IN ROOM 2530

NUBIAN PAINT AND VARNISH COMPANY

1856 North Leclair Avenue

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Division of **THE GLIDDEN COMPANY**

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Factories and Sales Offices: Chicago (Nubian Division), Cleveland, Reading, Pa., Minneapolis, New Orleans, St. Louis, San Francisco.
In Canada: The Glidden Company, Limited, Toronto, Ontario. Sales Offices in: Atlanta, Boston, Detroit, Los Angeles and New York City.

Glidden



Product Finishes

MAKERS OF NUBELITE • BOMBAY BLACKS • SPATTERLOID • SPATTERTONE AND OTHER FAMOUS INDUSTRIAL FINISHES

Dual finishing for metal tubing

manufactured from cold strip this tubing is plated (exterior) and lacquered (interior)

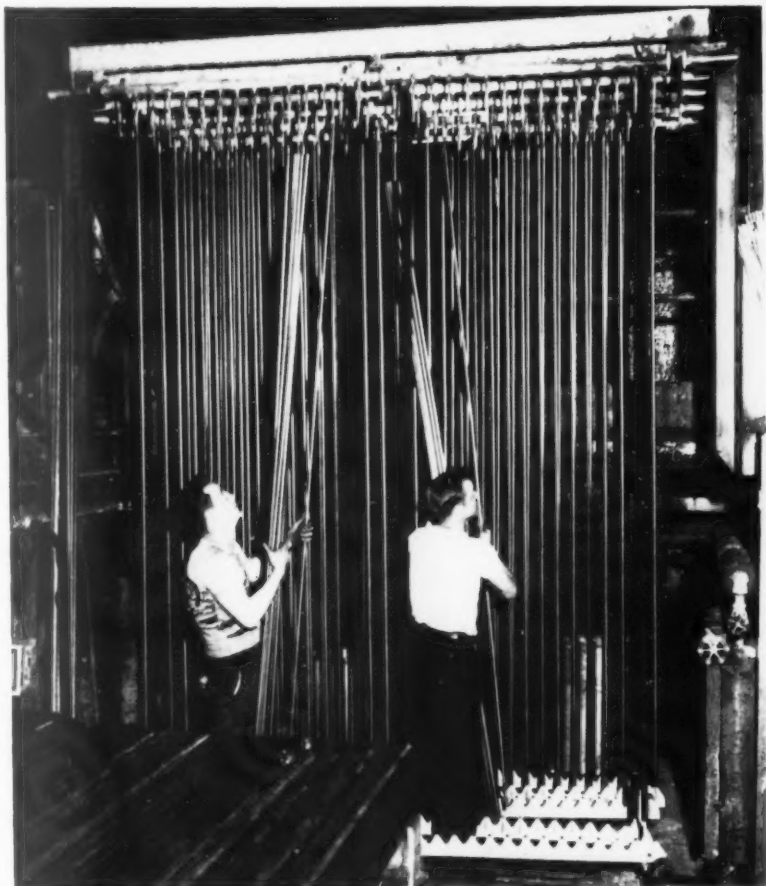
THE National Supply Company's newest product for the electrical industry, "central" electric metallic tubing, receives a complete exterior and interior surface finishing to give it added protection against the assaults of time.

The tubing is made at the Etna, Pennsylvania, plant of National Supply's Spang-Chalfant Division. It is a light-weight steel conduit and is adaptable to a wide variety of electrical raceway services.

Manufactured from cold strip, the tubing is made in an electric resistance weld tube mill and cut off into 10-foot lengths. Then the ends are reamed and chamfered. Next, the tubing is ready for the surface finishing consisting of zinc electroplating the exterior and lacquer coating the interior.

To begin the finishing cycle, the tubing is loaded into cages which are suspended from a monorail crane. The crane moves it from stage to stage until the cycle is completed.

The tubing is first given a bath in sulphuric acid, then rinsed in water, and moved to the electroplating tank where it receives an exterior coating of zinc. When the plating has been completed, the cage moves on to another clear water rinse, and then to an acid bath to brighten the finish.



Above: Loading tubing into cages at National Supply's Spang-Chalfant plant. The tubing is transported on these cages through the electroplating cycle.

Below: On this rack the tubing receives its interior lacquer coating. The tubing is placed against nozzles which force a clear lacquer through it.



Before the tubing is removed from the cage it is given a hot water bath.

Unloaded onto an inside painting rack, the tubing is placed against nozzles which force a clear lacquer over the interior surface. It is removed from the nozzles and conveyed along racks past hot air fans which dry the fresh lacquer coating. Finally, the electric metallic tubing arrives at the inspection table where the finishing job is checked.

An Underwriters' Laboratory approval label is put on each piece, the tubing is bundled, and is ready for shipment.



*Boy--are we glad
we switched to...*

MACCO DRAWING COMPOUNDS
and
MACCO ENAMEL CLEANERS

*...cleaned up 90% of our
pickle room problems
in a hurry!*

If you want to reduce scrap and cut press down time--switch to Macco Drawing Compounds...and... Macco Enamel Cleaners. They'll clean up 90% of your pickle room problems in a hurry.

They were specially formulated for porcelain enameling. They were designed to work together to reduce scrap and cut press down time. Used together they definitely eliminate 90% of the cause of rejects--resulting from incompatible drawing and cleaning compounds.

But, maybe you want proof. Okay--Macco engineers will supply it. They have plenty of experience--20 years of it. They'll recommend the Macco Drawing Compound ...and...Macco Enamel Cleaner which will make you say --"Boy--are we glad we switched!!" Write or phone.

CHEMICAL COMPOUNDS FOR THE METAL

525 W. 76th STREET ★ CHICAGO 20, ILL.

MACCO
PRODUCTS COMPANY

WORKING TRADE--SINCE 1931

The determination of opacity by means of a translucency meter

by Jesse DeLafayette Walton, Jr.

THE scope of this investigation was to determine the opacity of an enamel by a method which depended upon the translucency of the enamel. As compared with previous methods of opacity determination this article will present a new conception, or more probably a new approach to a basic conception.

Opacity, as defined by the enamel-ist, seemed to be used synonymously with reflection, and when the opacity was plotted graphically, it was usually referred to as percent reflectance as compared with magnesium oxide as a standard. From the viewpoint of the author, this method of determining opacity leaves much to be desired as to the minimum amount of opacifier to give the maximum opacity. Most of the reflectance-versus-percent-opacifier curves studied by the author were smooth, rather arching curves giving no specific point or even range of opacifier within a few per cent which would give both the best, and at the same time, the most economical amount of opacifier to use. These curves seemed to serve more to give a trend rather than to tell the enamel-

ist how much opacifier to use. Therefore, it is our aim to present a method by which values of translucency can be used to determine the effect of

Editor's Note:

The author was a student at the Georgia Institute of Technology when he prepared the accompanying paper. This paper won first prize in the first Ferro Contest for the best papers dealing with porcelain enameling technology. Winners in this contest were announced at the 52nd annual meeting of the American Ceramic Society. Mr. Walton is presently on the research staff of Ferro Enamel Corporation.

opacifier additions to a frit, and from these values a change in opacity can be plotted against per cent opacifier. Results of previous work with this method, as applied by the author to whiteware bodies, gave reason to believe that this type curve would represent a change in opacity varying from 0 to 95% or higher over a small range of added opacifier.

At this point we will review the work completed by the author in his undergraduate thesis. This thesis dealt

with the effect of varying one component of a whiteware body on the translucency of that body as determined by a translucency meter¹ built by the author (Figure 1). This meter measured the intensity of light allowed to strike a photoelectric cell in terms of microamps. The direct light produced by a domestic 100-watt light bulb at a fixed distance from the cell was taken as the basis for the translucency measurements. By introducing some non-opaque material between the light source and the photo cell, there was a decrease in the intensity of the light striking the cell and therefore a decrease in the reading of the meter. This reduced reading divided by the direct-light reading and multiplied by one hundred represented the per cent emergent light passing through the material. The term "per cent emergent light" was replaced by the less cumbersome word "translucency", and further reference to translucency in this article will have the same meaning as per cent emergent light for all calculating purposes, and will be represented by the letter "T."

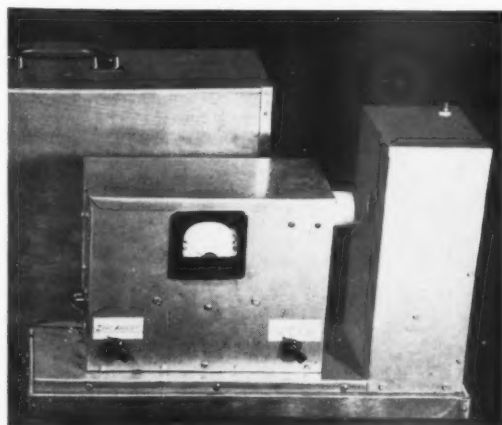


Figure 1—
Translucency meter
used in experiments
is shown at
left.

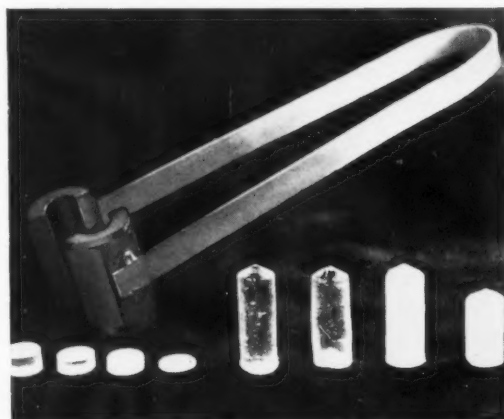


Figure 2—
Mold frit
samples and
sawed discs
are shown
at right.



Figure 3—This photo shows cylinders in the annealing furnace.

Since translucency is an exponential function of thickness, a graph of translucency versus thickness plotted on semilogarithmic graph paper produced a straight line. When such a curve was plotted for one particular percentage of material to be varied in a body, it was necessary to have at least three different thicknesses through which translucency measurements could be made. If several such curves were then plotted, one for each change in body composition, it was then possible to calculate a change in translucency produced by varying the constituent under observation. However, it was first necessary to decide upon a thickness which would be held constant since none of the lines were parallel. Once this thickness was decided upon, the following formula was devised to express a percentage change in translucency:

$$\% \Delta T = \frac{T_x - T_0}{T_0} \times 100$$

T_0

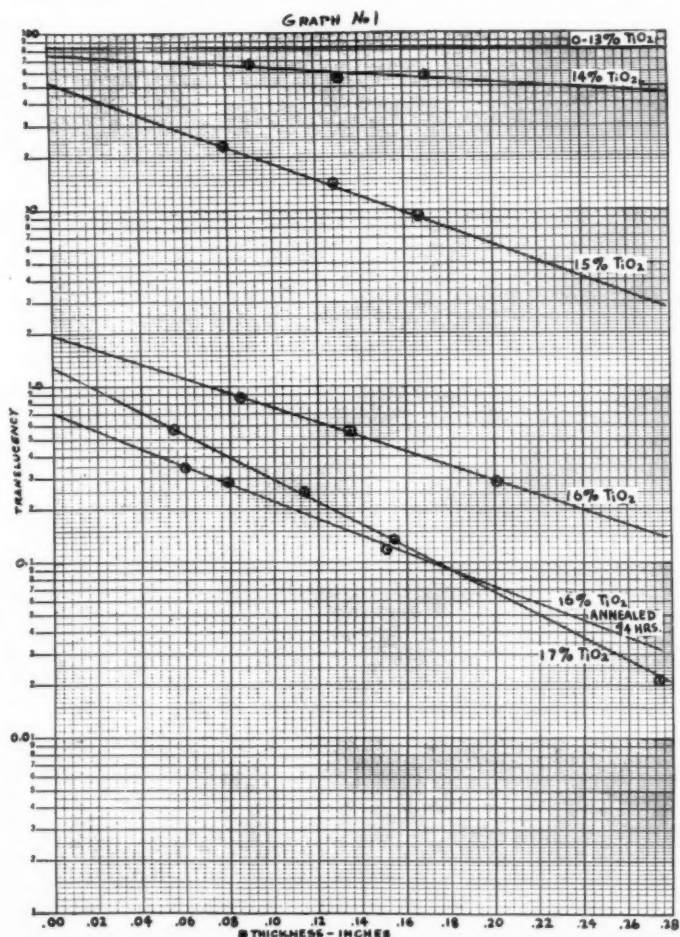
where T_x is the translucency of the body containing $X\%$ of varied constituent as read from the graph at the thickness decided upon. T_0 is the translucency of the body upon which the change is based, or possibly the body with 0% of the constituent under observation, this reading also being taken at the same thickness as T_x . In this formula, a positive sign indicated an increase in translucency, a negative sign a decrease. It was this formula which led the author to believe that, if this same procedure could be used on an enamel and the sign of the formula reversed so that a positive sign would be an increase

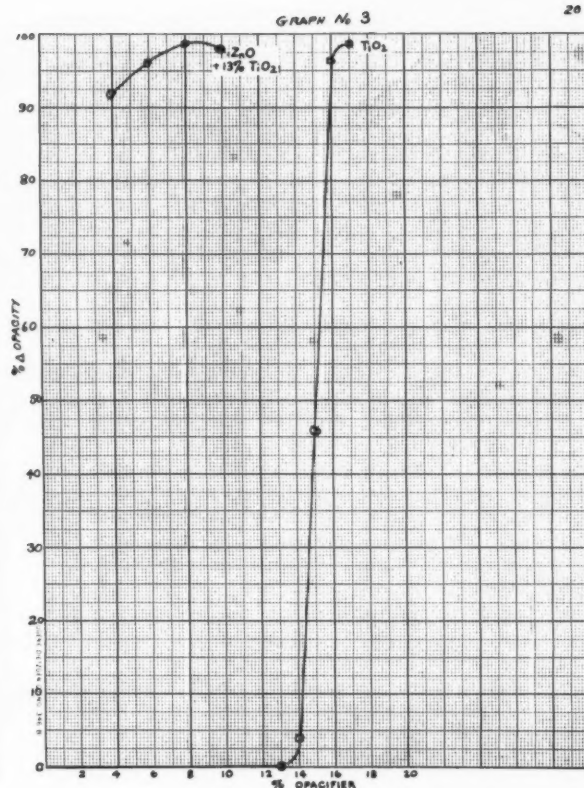
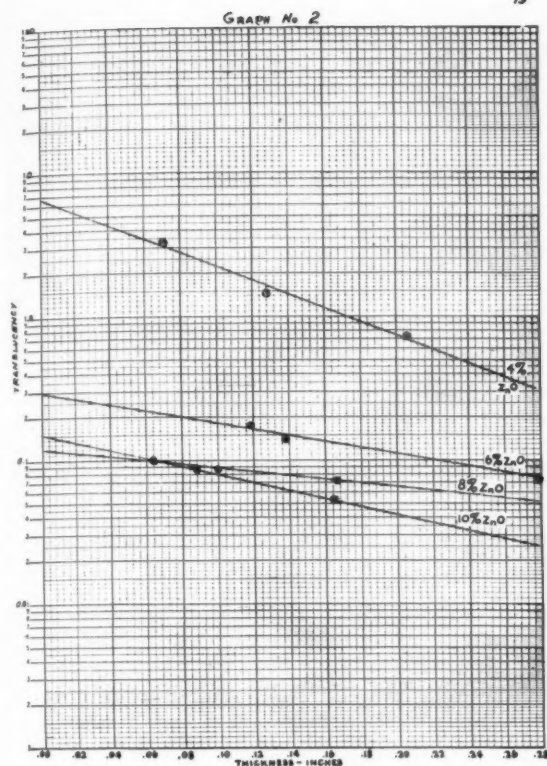
in opacity and a negative sign a decrease, a sharp "S"-type curve would result which would be a very useful tool to the enamelist, indicating to him the most economical amount of opacifier to use in any enamel for which such a curve was plotted.

Method of preparation

In order for translucency measure-

ments to be made with the translucency meter, the specimen must be: (1) of such a nature that light may pass through it and not be obstructed by any other object, (2) of sufficient thickness that accurate measurements of thickness may be taken, and (3) of sufficient size that it will completely cover the aperture opening through which the light must pass. Condition 1 immediately eliminated the possibility of using a piece of enameled metal for the investigation. If the enamel were stripped from the metal it would be improbable that a piece large enough to meet conditions 2 and 3, without cracking, could be obtained without great difficulty. In order to plot per cent emergent light versus thickness it was necessary to obtain at least three different thicknesses, and the difference between two thicknesses should be around 0.06 inches in order for large differences in translucency to be indicated. This last requirement was considered com-





pletely out of the range of thickness of porcelain enamel on metal, therefore, it was decided that some new method of preparing an enamel frit to meet the above requirements would have to be devised.

It was thought that if a cylinder of enamel frit, a minimum of $\frac{3}{8}$ " in diameter could be prepared that small sections of varying thicknesses could easily be cut with a diamond saw, and these "discs" used as the specimens upon which translucency measurements would be made.

Approach to the problem

The first approach to the problem was to obtain a length of porcelain tubing $\frac{3}{4}$ " inside diameter. Several lengths varying from one-half inch to three inches were cut, and one end sealed by placing the cylinder on end upon a 2" x 2" vitreous floor tile and sealing around the base with clay. The cylinder was then filled with a raw frit and placed in an electric furnace in which the frit was melted and allowed to cool very slowly. The coefficient of expansion of the frit and porcelain was so different that in all cases, the fritted glass was

filled with cracks, and in some cases, the porcelain cylinder was ruptured during cooling. Other sizes of tubing were tried, both smaller and larger, but in no case was there an absence of numerous and severe cooling cracks.

The possibility of using a metal cylinder was considered, but since the metal could not be cut with a diamond saw, and the fact that considerable metal would be taken into solution upon melting the frit, this idea seemed worthless.

The last and most practicable approach to the problem seemed the idea of pouring the liquid frit into a steel mold and then releasing the glass when it had cooled sufficiently to support its own weight. This process is approximately the same as all mechanical glass molding processes and would not be difficult to reproduce.

A piece of steel $2\frac{1}{2}$ " long, hexagonal in cross section measuring $1\frac{1}{2}$ " across the flats was available and thought suitable for the mold. A $\frac{3}{4}$ " diameter hole was drilled in the center of the hexagonal surface and to a depth of 2". The mold was

then sawed into two halves across two corners of the hexagonal surface. This left two flat surfaces parallel to the sawed surface. A piece of strap iron $\frac{3}{4}$ " wide and $\frac{1}{8}$ " thick and 24" long was bent into a V shape and the two ends welded to the two parallel flat surfaces of the mold, thus forming a handle. The mold could then be held closed with one hand while the frit was being poured and when the glass had cooled the pressure on the handle could be released and the mold would come apart releasing the glass cylinder (Figure 2). The first testing of the mold showed this method to be a simple, quick and effective method of preparing glass cylinders of a frit.

It was then evident that an annealing temperature would have to be decided upon, and it was thought that 1000°F. would probably be sufficient for relieving strains so that the cylinder could be sawed without danger of shattering. By means of two polarized lenses it was evidenced that all strains had been relieved when the cylinder was allowed to cool from 1000°F. to room temperature over a period of 15 hours.

to Page 58 →

FOOTE MINERAL COMPANY ANNOUNCES

"operation lithium"

AT KING'S MOUNTAIN, NORTH CAROLINA



The largest known deposits of rich, lithium-bearing spodumene are being commercially developed by Foote Mineral Company at its new King's Mountain, N. C. holdings.

In line with this vastly increased domestic raw material supply, Foote Mineral Company processing plant facilities are being expanded to make still more lithium chemicals available to industry.

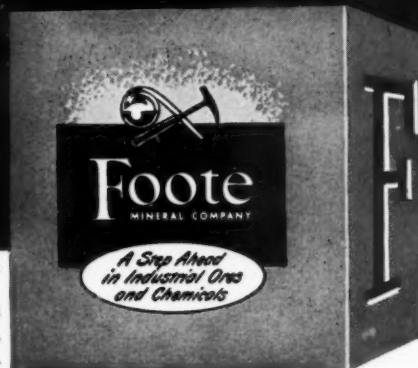
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Record attendance at annual meeting of American Ceramic Society



J. W. Hepplewhite, left, outgoing president, presenting gavel of office to H. R. Lillie, new ACS president, as W. E. Cramer, pres.-elect looks on.

A RECORD attendance of 2074 persons was registered during the 53rd annual meeting of the American Ceramic Society, held at the Palmer House in Chicago, April 22 through 26. The registration figure, which included residents from all parts of the United States and several foreign countries, compares with the 2041 attendance at last year's meeting in New York City, and 1877 at the golden anniversary meeting in Chicago in 1948.

Approximately 150 papers dealing with new findings in ceramic research and other technical aspects of the industry were presented and discussed at sessions of the Society's eight divisions.

The enamellers in attendance had the privilege of hearing some 17 papers at the Enamel Division sessions. The presence of a high percentage of practical enamellers indicated a trend to more papers within the comprehension of the practical plant man.

ACS officers of next year

Howard R. Lillie, research physicist, Corning Glass Works, Corning,

N. Y., was installed as president of the Society for 1951-52. President-elect is William E. Cramer, president of Industrial Ceramic Products, Inc.

Vice presidents for the coming year are: Probert W. Dager, sales engineer, H. C. Spinks Co.; Ray W. Pafford, vice president and general plant manager, Acme Brick Co.; and Ar-

thur A. Wells, vice president and general supt., Homer Laughlin China Co.

Treasurer is Edwin M. Rupp, sales engineer representing United Feldspar and Minerals Corp. and National Engineering Co. Charles S. Pearce continues as general secretary of ACS.

Enamel division officers

Officers of the Enamel Division for the coming year include: Chairman, E. E. Howe, Chicago Vitreous Enamel Product Co.; Vice Chairman, E. E. Marbaker, O. Hommel Fellow at Mellon Institute; Secretary, Wayne Deringer, A. O. Smith Corporation. Trustee is G. H. Spencer-Strong, Pemco Corporation.

Enamellers clubs coordinating committee meets

The Coordinating Committee for the porcelain enamellers clubs met Tuesday noon, April 24, with the following in attendance:

Eastern Enamellers Club—G. H. Spencer-Strong (Pemco); Central District Enamellers Club—R. H. Ham-mell (Tappan Stove); Midwest En-

Officers of the Enamel Division for 1951, left to right: E. E. Marbaker, vice chairman; E. E. Howe, chairman; Wayne Deringer, secretary; and G. H. Spencer-Strong, trustee.

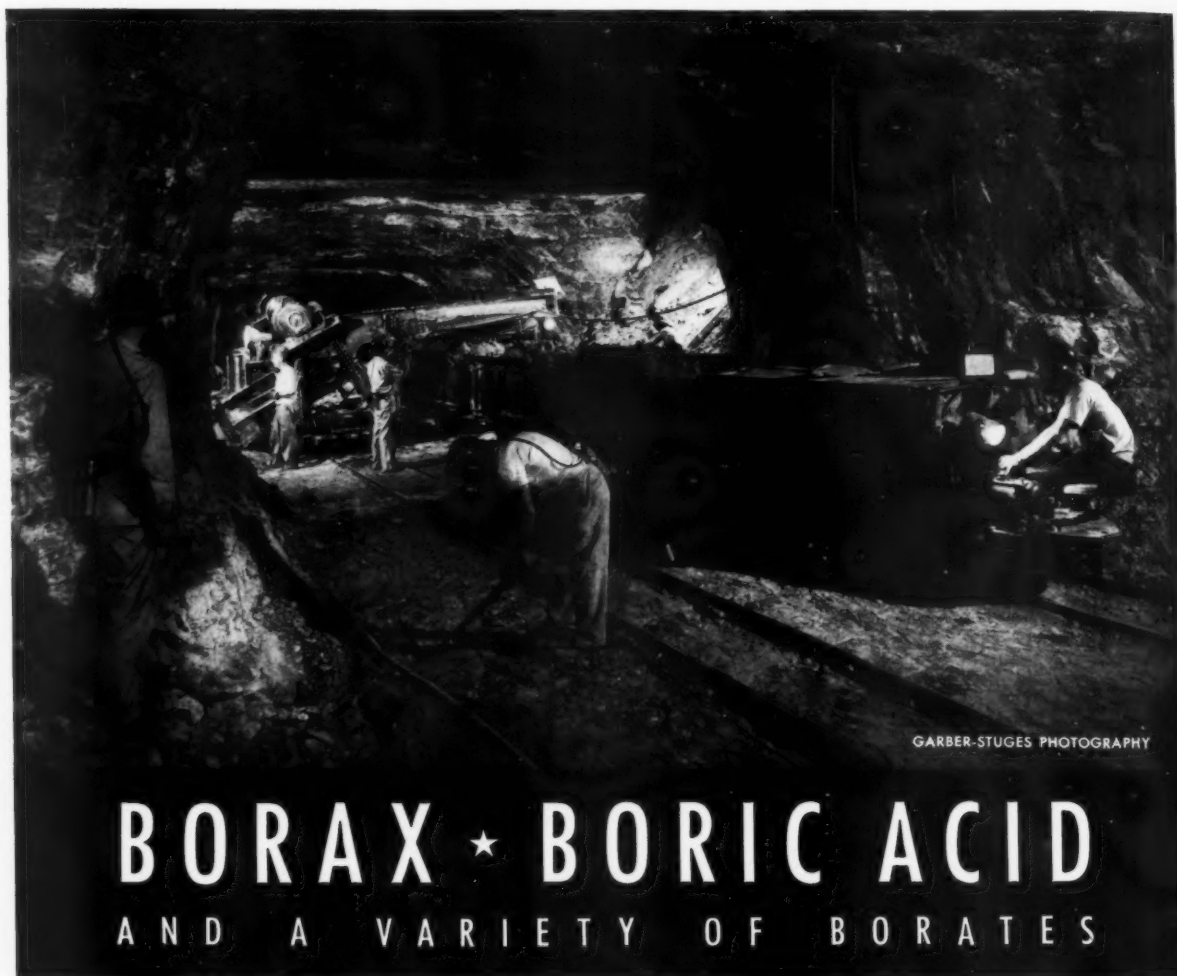
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In attendance at meeting of Coordinating Committee for district enamellers clubs, left to right, were: R. H. Hammell, Central Club; Dana Chase, Midwest; J. E. Hansen, Pacific Coast; Marcel Pouilly, W. J. Plankenhorn (chairman), F. A. Petersen, Rudyard Porter and Wayne Deringer, Midwest; G. H. Spencer-Strong, Eastern; and George Warren, of Porcelain Enamel Institute.



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amellers Club—Marcel Pouilly (De-Vilbiss), W. J. Plankenhorn (University of Illinois), Rudyard Porter (U. S. Steel), F. A. Petersen (University of Illinois), Wayne Deringer (A. O. Smith), Dana Chase (*finish*); Pacific Coast Enamellers Club—J. E. Hansen (Ferro). George Warren, PEI Fellow at the National Bureau of Standards, attended as a representative of the Porcelain Enamel Institute.

Name winners in contest promoting porcelain enamel

Winners in the second annual contest for the best papers from students in Ceramic Engineering Schools

on porcelain enameling technology were announced during one of the Enamel Division sessions.

Awards totaling \$1000, offered by Ferro Enamel Corporation, sponsors of the contest, were divided as follows:

First prize, \$500, Raymond J. Brown, University of Illinois, for his paper on "The Littleton Softening Point Test as a Method of Measuring Frit Fusibility."

Second prize, \$300, Harold P. Cahoon, University of Utah, "The Use of Phosphors in Vitreous Enamels."

Third prize, \$100, William F. Carroll, University of Washington,

"Vitreous Enamel for Aluminum."

Fourth prize, \$50, Paul C. Gaertner, Jr., Georgia Institute of Technology, "An Investigation of the Use of a Semi-Conducting Porcelain Enamel as a Means of Producing Copper-Copper Oxide Rectifiers." (Gaertner is now on duty as a U.S. Naval Reserve officer.)

Fifth prize, \$50, Charles K. Russell, University of Illinois, "The Effect of Thermal Expansion on the Torsional Adherence of Porcelain Enamels."

According to Dr. G. H. McIntyre, vice president and director of research, Ferro Enamel Corporation, all papers presented in the contest

Photo shows some of the enamellers in attendance at one of the Enamel Division sessions.

finishfoto



were good, representing a realistic approach to a technical subject.

Judges in the contest were Dr. McIntyre, Charles S. Pearce, of the American Ceramic Society, and Edward Mackasek, managing director of the Porcelain Enamel Institute.

1952 meeting in Pittsburgh

It was announced that the 54th annual meeting of the American Ceramic Society will be held in Pittsburgh, Pa., at the William Penn Hotel, April 27 through May 1, 1952.



Another view of enamellers in attendance at one of the Enamel Division sessions during the 53rd annual meeting of American Ceramic Society.

Authors' condensations of Enamel Division papers

THE following are authors' condensations of some of the technical papers presented at sessions of

the ACS Enamel Division during the 53rd annual meeting of the American Ceramic Society, in Chicago. Other

available condensations will be published as space permits.

The relation of bubble structure to spalling in porcelain enamel cover coats

by G. B. HUGHES, H. D. BOWSHER and J. A. SCHIEFFERLE

The past few years has produced a new defect in porcelain enamel cover coats with the introduction of the "two-temperature" domestic refrigerator. This defect, commonly referred to as "spalling", is found in the fresh food compartment. Spalling is believed to be caused by the penetration of moisture, which collects on the liner wall, into flaws or open bubbles which may be present in the enamel surface, freezes and expands, applying strains to the cover coat causing portions of the cover coat to crack or pop-off. Laboratory tests have shown that the presence of moisture, temperature fluctuation above and below freezing, and the proper bubble structure are necessary to produce spalling.

It is believed there is a definite correlation between the size of bubbles in the cover coat and spalling, and spalling will not occur unless the bubbles are close enough to the surface to allow moisture to enter.

Enamels are presently being by placing the test specimens on continuously refrigerated coils and deiced every two minutes with 70° F.

water. Approximately 5000 cycles are accomplished weekly, and a complete test is of four to six weeks duration.

Specimens were cleaned with acetone or methyl alcohol to remove any accumulated grease and etched with 24% HF for a predetermined period of time to give the desired depth. A suitably weighted rubber ring was used as a container. Film thickness measurements were made before and after each etch to determine the depth. The bubbles were counted using a binocular microscope at 30 magnification and the apparent diameter measured with a micrometer eyepiece disc. To facilitate counting, 0.25 sq. in. of the etched area was ruled off into sixteen $\frac{1}{8}$ inch squares, using a soft metal paper clip as a stylus. The bubble counts were recorded as bubbles per square inch.

Bubble counts on laboratory burning range series showed relatively no correlation between spall resistance and bubbles larger than 0.001 inch at a depth of 0.0001 inch.

To determine the size of bubbles which had caused spalls, a number of

bubbles at the apex of spalls were measured. From a distribution curve it was found that the majority of spalls originated from bubbles 0.005-0.010 inch in diameter.

A method of progressive etch was evolved to determine the bubble size distribution at various depths below the surface. Size categories of 0.002-0.003 inch, 0.003-0.004 inch and larger were arbitrarily fixed in order to eliminate the minute bubbles and place the larger bubbles into definite groups.

From the data on hand, the best correlation between spalling and bubble count is obtained from the count of bubbles 0.003 inch and larger at a depth of 0.0009 inch, and 200 bubbles per sq. in. is the maximum for satisfactory spall resistance.

On the basis of this study, the following conclusions appear logical:

1. A definite correlation exists between the spall resistance of cover coats and the number of bubbles whose apparent diameter is 0.003 in. and larger at a depth of 0.0009 inch below the surface.

2. The etch method of evaluating

enamel cover coats for spall resistance is sufficiently accurate to be useful, both as a daily production control and laboratory test.

3. The accuracy of the method is such that the effect of mill additions, milling, ground coats, base metals, firing, etc. on spalling can be more

quickly evaluated at a considerable saving in man-hours and expense than with the present test apparatus.

Factors affecting the rusting and spalling of titania enamels under alternate freezing and thawing in the presence of moisture

by ROBERT F. PATRICK

Several years ago the cold-wall refrigerator was introduced on a commercial scale. In this type of unit the cooling coils partially surround the liner, and the enamel on the interior of these liners is subjected to alternate freezing and thawing in the presence of moisture.

The enamel in some of these early units showed severe rusting and spalling in service. Such a phenomenon naturally necessitated an accelerated research program to study the various factors involved and thereby attempt to resolve the difficulty. Fortunately, the answers were forthcoming, and the rusting and spalling problem is now relatively negligible.

The general problem may be divided into two parts:

1. The establishment of test methods to determine the spalling resistance of a particular enamel.

2. Determination and elimination, where possible, of the causes of spalling.

A superficial examination indicated that the rust spots and spalls were associated with the bubble structure of the enamel.

In this study the plates were tested for their spalling resistance in an accelerated spall tester.

Various factors—such as the mill formula, cover coat frit, firing conditions and ground coat—were studied in relation to their effect on cold wall rusting and spalling.

Rusting and spalling are directly related to the bubble structure of the cover coat. Therefore, any factors that increase the size and number of bubbles in the cover coat will tend to decrease rusting and spalling resistance.

The mill formula is one of the most important factors in determining the bubble structure of the cover coat. Gum of tragacanth is especially deleterious. The clay, bentonite, and potassium carbonate should be kept as

low as possible. Considerable differences in the structure of the cover coat were noted using different clays. A substitution of sodium aluminate for potassium carbonate was found to be beneficial.

Firing conditions—such as time, temperature and general type of furnace—are important factors in determining the enamel structure. Plates fired in a continuous furnace have better spalling resistance than those fired at the same temperature in a box furnace.

There are some indications that the cover coat frit may have an effect on the spalling resistance. It is questionable whether or not the ground coat has any effect on the bubble formation of the cover coat.

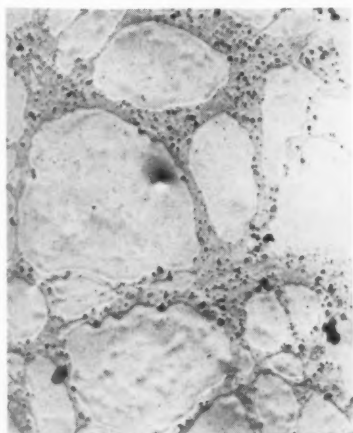
Some miscellaneous factors—such as base metal, contamination; etc.—can exert very serious effects on the cover coat spalling and rusting resistance.

Islanding, a surface characteristic of some porcelain enamels

by M. K. BLANCHARD and W. A. DERINGER

The paper describes the characteristics of a pattern that appears on the surfaces of some porcelain en-

Figure 1 — Photomicrograph of unetched islanded enamel surface.



amels. The descriptive terms "islanding" and "islands" were applied to this surface phenomenon because of its resemblance to a close packed system of islands separated by narrow, rivulet-like boundaries. Figures 1 and 2 are microphotographs (85X) of etched and unetched islanded surfaces.

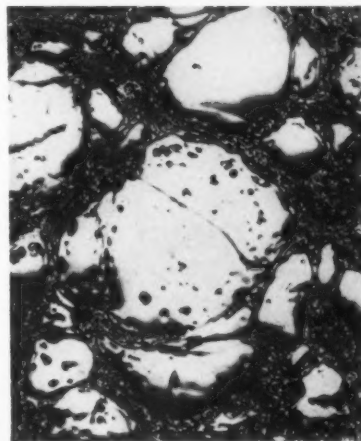
Methods of microscopic observations of islands were discussed and the results of several experiments were used to show that:

1. Islands are formed on the surfaces of some porcelain enamels, and their sizes and shapes are generally relatable to the sizes of frit grains used in the enamel.

2. Borders around the islands are probably composed of finely divided frit, clay, and leached salts; and they

differ enough from the islands to allow ready observation on etched or unetched surfaces. →

Figure 2 — Photomicrograph of etched islanded enamel surface.



3. Islands and borders are essentially two different glassy compositions in a system that is normally

assumed to be one homogeneous phase. The influence of the two phase system can be extensive—particular-

ly in determining the corrosion resistance of a porcelain enamel.

The cobalt reduction theory for the adherence of sheet-iron ground coats

by J. H. HEALY and A. I. ANDREWS

Through the use of special techniques, new data on the adherence phenomenon of cobalt ground coat enamels were obtained and the hydrogen reduction theory developed. In order to observe the chemical processes taking place in standard sheet-iron ground coat enamels, particularly at the iron-enamel interface, the so-called coarse-grained particle technique was developed. The coarse-grained particle technique is essentially a mixture of coarse frit particles (20-60 mesh), of a clear, colorless frit and a frit containing the metal oxide in question, sprinkled dry and fired on sheet iron, so that observations of the iron-enamel containing metal oxide interface can be made by sighting through the clear, colorless enamel.

Observations made with this special technique were that a grayish layer, which was identified by X-rays to be cobalt metal, forms between the iron oxides and a glass containing cobalt oxide. With a further increase in temperature, the iron oxides are reduced by hydrogen to metallic iron and are dissolved in the glass permit-

ting the grayish cobalt particles to attach themselves to the iron base metal and form a triple adherence: iron-cobalt-glass. An increase of

ing atmosphere; however, cobalt metal is stable in reducing or neutral atmospheres. Also, the cobalt ion in solution in glass is only reduced to

STRUCTURE FORMATIONS IN COBALT OXIDE ENAMELS

TEMP. °F.	A 1	A 2	A 3	A 4	A 5
1325	NO FORMATION				
1350					
1450	GREYISH LAYER				
1475					
1500					
1600	NEEDLES				
1700					
1800	DENDRITES				

cobalt ion concentration and/or an increase in temperature develop not only cobalt metal particles, but develop cobalt metal needles and dendrites. Observations made during firing of the samples revealed that the grayish particles, needles, and dendrites formed during firing and not precipitated during the subsequent cooling.

Other tests indicated that cobalt metal is only formed from glasses containing cobalt oxide in a reduc-

metallic cobalt at the metal-glass interface of metals which form hydrogen through metal-water reactions.

The theory, in brief, states that as a result of the hydrogen being present at the iron-enamel interface, reducible metal oxides (cobalt oxide in this case) have to be present to be reduced and consume the hydrogen which would otherwise form an insulating layer. For complete theory see: "Cobalt Reduction Theory," *finish*, 7 (12) 22-23 (1950).



Note: A1 represents an enamel containing 0.5% Co_3O_4 ; A2—1.0% Co_3O_4 ; A3—2.0% Co_3O_4 ; A4—4.0% Co_3O_4 ; and A5—8.0% Co_3O_4 .

Left: Showing cobalt dendrites in sheet iron ground coat enamels.

Refrigeration equipment mfrs. meet in Hot Springs, Va.

SEVERAL hundred manufacturers of refrigeration and air conditioning equipment met at The Homestead, Hot Springs, Virginia, on April 30 and May 1, for product section meetings and the 16th annual meeting of the Refrigeration Equipment Manufacturers Association.

New officers who took over the helm of REMA on May 1 include:

President: W. A. Siegfried, president of Superior Valve & Fittings Co., Pittsburgh, Pa.; Vice President, R. L. Sears, director of sales, Lynch Corporation, Toledo, Ohio; Treasurer, John E. Dube, president, Alco Valve Company, St. Louis; Secretary, L. C. McKesson, vice president, sales, Ansul Chemical Company, Marinette, Wisconsin.

These new officers, together with R. H. Israel, retiring president, become the Executive Committee of REMA for the fiscal year ending on May 1, 1952.

Newly-elected directors of the Association are:

J. A. Dugan, Bundy Tubing Co., Detroit; James Emmett, Jr., sales manager, Jas. P. Marsh Corp., Skokie, Ill.; Henry Steinhorst, president,

Emil Steinhorst & Sons, Inc., Utica, N.Y.; J. W. Krall, executive vice president, Tyler Fixture Corp., Niles,



W. A. SIEGFRIED, REMA PRESIDENT

Mich.; and H. M. Brundage, General Electric Co., Bloomfield, N.J.

Others continuing to serve on REMA's board of directors are:

Jack Searls, vice president, sales, White-Rodgers Electric Co., St. Louis; W. F. Switzer, commercial sales manager, Frigidaire Division of GMC, Dayton, Ohio; H. Blake Thomas, vice president, sales, McQuay, Inc., Minne-

apolis; and Lud Emde, president, Temprite Products Corp., Birmingham, Mich.

Advisory members of the board of directors, made up of past presidents, are:

E. A. Vallee, vice president, A-P Controls Corp., Milwaukee; R. H. Luscombe, sales manager, Penn Electric Switch Co., Goshen, Indiana; H. F. Spoehrer, vice president, Sporlan Valve Co., St. Louis; E. M. Flannery, vice president, The Bush Manufacturing Co., West Hartford, Conn.; H. F. Hildreth, manager, Refrigeration specialties department, Westinghouse Electric Corporation, Springfield, Mass.; and K. B. Thorndike, vice president, Detroit Lubricator Co., Chicago.

W. Vernon Brumbaugh continues as executive secretary of REMA.

Membership report

A report by H. C. Morrison, of Curtis Refrigerating Machine Division, revealed that REMA's membership now totals 119, compared to 112 a year ago.

The Controlled Materials Plans Administrator may look to the Asso-

Past presidents of REMA just prior to receiving distinguished service awards, left to right: H. F. Hildreth, Westinghouse; H. F. Spoehrer, Sporlan Valve; E. M. Flannery, Bush Mfg.; R. H. Luscombe, Penn Elec. Switch; K. B. Thorndike, Detroit Lubricator; R. H. Israel, Virginia Smelting. Also shown are W. Vernon Brumbaugh, REMA executive secretary, and W. A. Siegfried, newly-elected president of the Association.



ciation for certain facts concerning basic materials consumption, stated E. B. Bower, of Nash-Kelvinator Corp., and chairman of the general statistics committee. He urged prompt response by members to any questionnaire that may be sent out on the subject.

Movie on food freezers

Following the Association's business session, members viewed for the first time a colored motion picture produced by the Food Freezer Section entitled "Tips from Your Food Freezer."

Past presidents of REMA were then presented with distinguished service awards in the form of engraved plaques as public acknowledgment of their service to industry.

All-industry show in Chicago

The 7th all-industry refrigeration and air conditioning exposition, sponsored by REMA, will be held at the



New officers of REMA, left to right, are: R. L. Sears, vice president; W. A. Siegfried, president; John Dube, treasurer; L. C. McKesson, secretary.

Navy Pier, Chicago, November 5-8, barring some major national crisis. R. H. Israel, of Virginia Smelting Co., and retiring Association president, stated that the sale of space

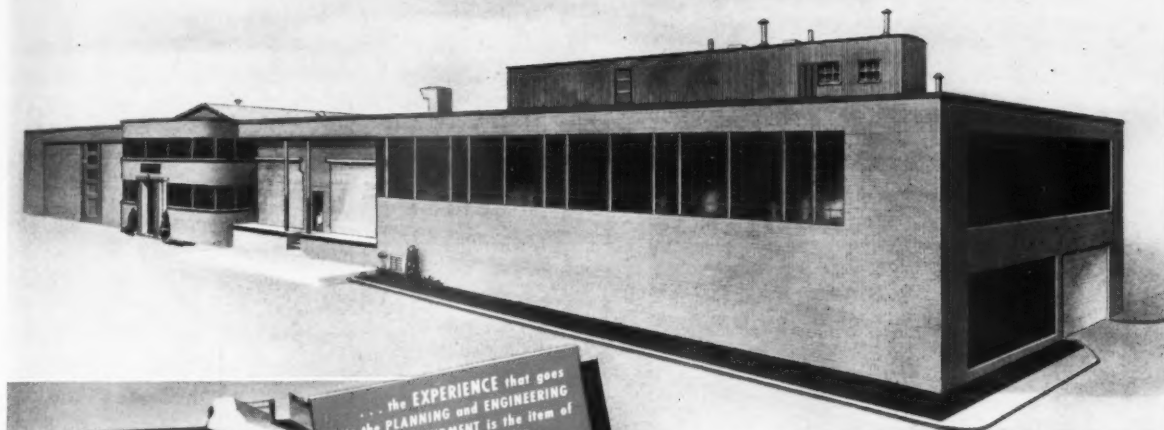
for the show has already assured its being the largest in the history of the event. He added that the Sherman Hotel will be REMA headquarters during the exposition.



Photo shows the officers and members of the board of directors of the Refrigeration Equipment Manufacturers Association who attended the annual meeting of REMA on May 1.

COMPLETE *Finishing* SYSTEMS

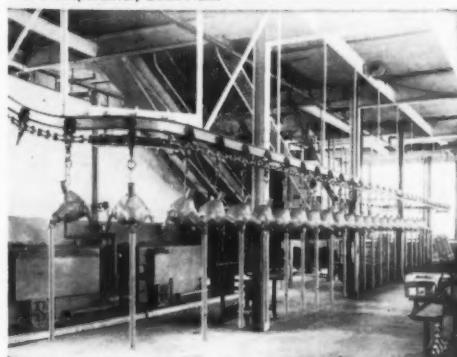
for ENAMEL • LACQUER • PAINT



Ultramodern Plant of the Danuser Machine Company, Fulton, Missouri. Note Finish Baking Oven of a Complete Modern Finishing System is Located on the Roof.



Illustration Above Shows Compact Arrangement of a Complete Mahon Finishing System Designed to Handle Finishing Production in a Comparatively Small Plant.



Loading and Unloading Area. Two-Stage Cleaning Machine and a Two-Color Flow-Coating Machine are in the Background.

Small Plant Operators, Too, CUT FINISHING COSTS with MODERN MAHON EQUIPMENT!

While the Mahon Nameplate appears on Finishing Equipment in almost every large production plant in the country, it is singularly significant that so many comparatively small companies also pay a little more for modern Mahon equipment. The Danuser Machine Company, Fulton, Missouri, manufacturers of earth moving equipment and farm tools, is a typical example. This company operates a Complete Mahon Finishing System specially designed to meet its specific production requirements . . . the completely conveyORIZED system consists of a two-stage Cleaning Machine, Dry-Off Oven, a two-color Flow-Coating Machine and a Finish Baking Oven—the latter being an outdoor oven installed on the roof to conserve space. The owner of this plant is one of many small plant operators who have found that their finishing equipment requirements will receive from Mahon the same careful preliminary study, and the same experience-backed planning and engineering that goes into finishing systems installed for the largest plants in the world. If you are contemplating new equipment, do not hesitate to call in Mahon engineers . . . you will benefit from a wealth of technical knowledge and practical know-how not available to you elsewhere. See Mahon's Insert in Sweet's Mechanical Industries File for complete information, or write for Catalog A-650.

T H E R . C . M A H O N C O M P A N Y
HOME OFFICE and PLANT, Detroit 34, Mich. • WESTERN SALES DIVISION, Chicago 4, Ill.

Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning and Pickling Equipment, Metal Cleaning and Rust Proofing Equipment, Dry-Off Ovens, Hydro-Filter Spray Booths, Filtered Air Supply Systems, and Drying and Baking Ovens; Core Ovens, Dust Collecting Systems, Fog-Filters, and many other Units of Special Equipment.

MAHON

NEWS

RHEEM TO FABRICATE NORTHROP F-89 COMPONENTS

Rheem Manufacturing Company's Aircraft Division announced receipt of a letter of intent from Northrop Aircraft, Inc., for fabrication and assembly of components for the new standard all-weather interceptor plane for the Air Force, the Scorpion F-89, which is now in large quantity production.

Preliminary work will begin shortly at Rheem's South Gate, Calif., plant, but actual fabrication and assembly will be at its new aircraft plant at Downey, Calif.

\$5 MILLION CARTRIDGE CASE CONTRACT TO INGERSOLL PROD.

A \$5,000,000 contract for production of large caliber steel cartridge cases for ammunition has been released to the Chicago plant of Ingersoll Products Division of Borg-Warner Corporation.

R. S. Ingersoll, president, said his company plans about 30,000 square feet of new construction which, with 15,000 square feet of existing facilities, will house the project. Production will be on a two-shift basis to meet Army demands.

PHILCO, MIT JOIN IN SCIENTIFIC RESEARCH

William Balderston, president of Philco Corporation, announced that his firm will join with Massachusetts Institute of Technology in many fields of scientific research during the next

five years. Engineers of the two organizations will join in intensified cooperative research in military and commercial electronics, television and radio, refrigeration and home appliances, and other fields. The program also calls for special seminars and conferences, exchange visits, use of scientific libraries, and a joint policy to cover inventions and patents.

NAPALM BOMB CONTRACT TO AMERICAN STOVE

American Stove Company, St. Louis, has been awarded a contract to produce napalm (fire) bombs, it was announced jointly by the company and Air Force authorities.

Part of the firm's St. Louis factory is being converted to accommodate bomb manufacture. This plant, which produces Magic Chef gas ranges, will continue range production at the maximum rate allowed by government regulations.

HOME LAUNDRY EQUIPMENT SALES CONTINUE HIGH

Washer sales in March, 1951 totalled 368,455 units, 7.9 per cent ahead of 341,328 in the preceding month. Washer sales for the first quarter aggregated 1,030,875 units, compared to 1,042,345 in the opening quarter of 1950, down 1.1 per cent.

Automatic tumbler dryers sold in March totalled 44,020, up 19.5 per cent from 36,851 in February and 62.3 per cent more than 27,125 in March, 1950.

Factory sales of ironers in March,

34,700 units, compared to 32,400 in the preceding month, a gain of 7.1 per cent.

PHILCO GOVERNMENT DIV.

Philco Corporation has established a separate Government and Industrial Operating Division to handle increased output of government and industrial products, reports William Balderston, president.

Joseph H. Gillies has been named vice president in charge of operations of the new division and will also continue as vice president of operations of the television and radio division.

William J. Peltz has been appointed manager of operation for the division; James D. McLean, general sales manager; and Robert F. Herr, vice president, will direct all Government and Industrial Division sales and contract negotiations.

WHIRLPOOL EMPLOYEE GETS \$11,000 FOR IDEA

James Hembree, a 22-year-old employee of Whirlpool Corporation, St. Joseph, Michigan, will receive \$11,000 for a suggestion he made which improved quality yet lowered production costs of one of Whirlpool's products. His award equals half of the net savings to result from his suggestion for the first year.

The Whirlpool Suggestion Plan has been in effect a year and has paid more than \$22,000 to employees for improvement ideas.

ALCOA TOP STAFF CHANGES

Roy A. Hunt, president of Alcoa since 1928, is now chairman of the executive committee, and I. W. Wilson, formerly senior vice president, is now president.

COOLERATOR APPTS.

L. W. Hamper, president of The Coolerator Company, has announced the appointments of S. W. Skowbo as vice president of operations, and W. C. Conley, Jr. as vice president of marketing activities. The appointments followed the resignation of

Ward R. Schafer, vice president and general manager, who is now operating a Coolerator distributorship, said Hamper.

MORRISON CHIEF ENGINEER

B. V. Ronco has been named chief engineer of Morrison Steel Products, Inc., Buffalo manufacturers of pressed steel furnaces for gas and oil, and automotive stampings, it was announced by Arthur J. Harsch, vice president of engineering.

PERFECTION CHIEF ENGINEER

William M. Day has been appointed chief engineer, Perfection Stove Company, it was announced by Marc Resek, vice president and director of engineering. Day has been assistant chief engineer since 1947.

NESCO APPOINTMENTS

William Howlett, president, Nesco, Inc., has announced the appointment of Richard L. Gray as assistant to the president. Gray will be responsible for coordinating the firm's new goods program.

At the same time, Howlett announced the appointment of William J. Freund as advertising manager. Freund was previously with the Byer & Bowman Agency, Columbus, Ohio.

JAMES MANNING, MGR. SALES FLORENCE RANGE DIVISION

C. Fred Lucas, vice president sales, Florence Stove Company, announced the appointment of James J. Manning to the newly-created position of manager of sales, range division. Manning was formerly New England division manager, and will be succeeded in this position by Thomas P. Nugent.

ALCOA EXPANSION

Two major programs, announced by Alcoa in 1950, will increase the company's production of defense aluminum by about 50 per cent annually. The first, referred to as a "quick action" plan, is already operating and providing aluminum to the national stockpile through the use of standby facilities and high-cost elec-

tric power. The second program involves the erection of permanent new capacity capable of producing 240,000,000 pounds of aluminum annually.

BORG-WARNER SALES UP

Net sales for Borg-Warner Corporation and subsidiary companies for the first three months of 1951 were reported at \$100,600,870.47, as compared with \$70,656,559.58 for the first three months of 1950. The firm's net earnings for the first three months of 1951 were reported at \$5,777,-

475.13, and at \$6,541,805.71 for the first three months of 1950.

EKCO SALES UP 52%

IN FIRST QUARTER

Arthur Keating, chairman of the board of Ekco Products Company, announced that the earnings for the company's domestic and Canadian operations in the first quarter of 1951 totaled \$941,715. This compares with earnings of \$489,381 in the like quarter of 1950. Sales for the first quarter of 1951 totaled \$10,492,769, the big-

STOVE MEN MEET IN CINCINNATI JUNE 4-6

PROGRAM

The 19th annual convention and exhibit of the Institute of Cooking and Heating Appliance Manufacturers will be held at the Netherland Plaza, Cincinnati, Ohio, June 4, 5 and 6. The tentative program is as follows:

Monday, June 4

- 10:00 a.m. — *Board of Trustees*, Walter F. Muhlbach, presiding
Oil Division Technical Section, Roy W. Johnson, presiding
Kerosene Stove Division, John M. Bayer, presiding
- 12:30 a.m. — *Exporters Luncheon Meeting*, W. M. Bonnell, presiding
- 2:30 p.m. — *Gas Space Heater and Floor Furnace Division*, R. M. Liedstrand, presiding
Electric Range Division, H. J. Holbrook, presiding

Tuesday, June 5

- 8:30 a.m. — *Breakfast for Sleeve-Type Oil Burner Division*, Earle B. Kaufman, presiding
- 10:00 a.m. — *General Session*, Walter F. Muhlbach, presiding
President's annual report, Walter F. Muhlbach, director of distribution and research, Florence Stove Co.
"An Economic Forecast for 1951," Martin R. Gainsbrugh, chief economist, National Industrial Conference Board
"Plan Now for Sound Selling in the Future," James C. Olson, partner, Booz, Allen & Hamilton, management consultants
"Washington Report," George P. Lamb, partner, Kittle & Lamb, attorneys

1:00 p.m. — *Luncheon*

- 2:30 p.m. — *Factory Management Meeting*, T. E. Keller, presiding
Financial, Accounting and Credit Executives, Robert N. Smith, presiding
Sales, Advertising and Marketing Research Meeting, Norman Kreuter, presiding

7:30 p.m. — *President's Reception and Dinner*

Wednesday, June 6

- 10:00 a.m. — *Gas and Combination Range Division*, W. T. Trueblood, Jr., presiding
Oil Division, A. D. Olds, presiding
Solid Fuels Division, Kenneth Brown, presiding
- 12:30 p.m. — *Luncheon for Top Management Executives*, Walter F. Muhlbach, presiding (attendance limited to one designated representative from each active member company of ICHAM)

Spray Your Products ***ELECTRONICALLY***

USE UP TO

70% LESS PAINT

WITH THE *New* **ASHDEE**
ELECTRONIC

PAINT MISER



Turns Paint Losses into Profits

Why spray away thousands of dollars in paint waste annually, when it's so easy to save almost every bit with the sensational new Paint-Miser. Used in conjunction with your present finishing equipment, Paint-Miser precipitates up to 95% of the paint on the work . . . practically abolishes off-spray. Adapts readily to any finishing department . . . extensive changes not required. Put Paint-Miser to work for you now . . . it will effect tremendous savings in both paint and man-hours, and greatly reduce operating costs. Paint-Miser is sold outright. No royalties to pay. It's in a class by itself. Write, wire for complete details at once!

Get Far Greater Production...Cut operating costs
Get Better, More Uniform Coverage
Use Less Manpower... Use Less Air
Reduces Off-Spray to a Minimum
No Build-Up or "Fatty" Edges
Saves Thousands of Dollars Yearly
No royalties to pay... you can buy it outright



ASHDEE PRODUCTS, INC.

18029 Dixie Highway • Homewood, Illinois

gest in the firm's history, and an increase of 52% over the first quarter of 1950.

Keating said Ekco now has approxi-

mately \$9,280,000 in defense contracts, and has been able to handle all of its defense work without interruption to normal civilian production.

INGERSOLL PRODUCTS DIVISION OPEN HOUSE



Ingersoll Products Division, Borg-Warner Corporation, Chicago works, was host to more than six thousand persons on May 9 and 10 at the plant's first open house. Displays and guided tours showed processes used in the firm's manufacture of porcelain enamel products, farm implement and automotive parts. The company

employs approximately 1500 persons. Photo shows Joan Crist, left, and Dolores Stern, right, holding souvenir booklets given to every visitor at the open house. The display of porcelain enamel products represents samples of Ingersoll's contribution to the home appliance industry.

STANDARDIZED SELLING TERMS APPROVED FOR PRESSED METAL FABRICATION INDUSTRY

For the past year and one-half the Pressed Metal Institute has been analyzing selling terms used by many companies in the stamping industry towards the end of offering standardized selling terms provided concurrence could be reached with the National Association of Purchasing Agents. This approval has now been secured and the Terms and Conditions of Sale for the Pressed Metal Fabricating Industry are currently being released to the industry.

Sample copies of "Terms and Conditions of Sale" for the Pressed Metal Fabricating Industry (approved by the National Association of Purchasing Agents) may be obtained by writing on company letterhead to the

Pressed Metal Institute, 13210 Shaker Square, Cleveland 20, Ohio, or to *finish*.

WESTINGHOUSE APPLIANCE DIV. SAVES \$1,500,000 ON SCRAP

A scrap conservation program at the Westinghouse Electric Appliance Division plant, Mansfield, Ohio, has added to appliance production and produced a savings estimated at \$1,500,000 a year, according to J. H. Ashbaugh, vice president.

Ashbaugh said copper, aluminum, brass, nickel and steel are being culled from production lines daily. Some of the material is reprocessed; stamping methods are changed to stretch

scarce steel; plating processes are improved to stretch copper and nickel supplies. In 1950 the division's salvage department recovered for further use in the production of appliances more than 23,000 tons of steel and more than 815,000 pounds of non-ferrous metals.

KENNEDY HEADS STEEL PROCUREMENT AT WESTINGHOUSE

Andrew M. Kennedy, Jr., has been appointed director of purchasing in charge of steel procurement for Westinghouse Electric Corporation, it was announced recently by Bruce D. Henderson, general purchasing agent for the firm.

Kennedy, who will maintain headquarters in the Pittsburgh offices, was formerly manager of purchasing, stores and shipping department at the Westinghouse Transformer Division, Sharon, Pa.

NEW OWENS-CORNING V. P.



E. W. "Pat" Smith has been elected a vice president of Owens-Corning Fiberglas Corporation, it was announced by Harold Boeschenstein, president. Smith is in charge of merchandising and advertising programs, branch office contacts and sales recruiting and training activities in the firm's general sales department. Prior to joining Owens-Corning, he was associated with Philip Carey Manufacturing Company, Johns-Manville Corp., and Certain-teed Products Corp.

more news →



Clockwise: W. T. Trueblood, American Stove; A. S. Martinson, Hammel; Howard Tucker, Coleman; Frank Henke, Howard Goss, W. F. Johnson, Harper-Wyman; W. F. Muhlbach, Florence Stove; R. F. Knudson, American Gas Mach.; A. L. Johnson, Queen Stove; F. A. Kaiser, Detroit-Michigan.

Stanley Gorman, GAMA; E. F. DuPuis, Lincoln Brass; Ray McLellan, Wallaceburg Brass; Don DuPerow, Lincoln; E. S. Adams, Owens-Corning; C. H. Rippe, Hamilton; G. W. Field, Bendix; W. W. Kuenn, Owens-Corning; Arthur Dolan, Hoyt; M. E. Miller, Nat'l Steel Const.



G. Rieley, Lennox; Mr. & Mrs. F. W. Schmidt, Roberts Brass; Handley, H. E. Handley, Handley-Brown; Mrs. Massey, Harold Massey, GAMA; Fred Peters and John Lyle, Ruud; B. E. Engstrom and J. Schick, Minneapolis-Honeywell.

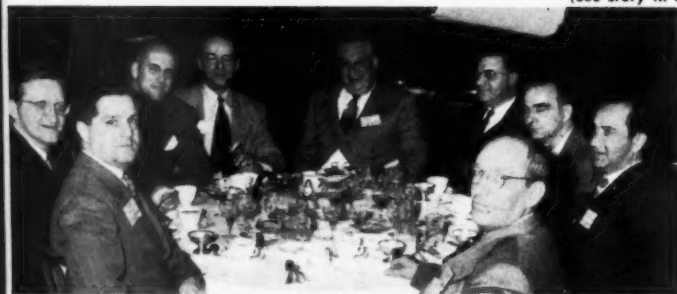
Bob Moore, M-H; F. L. Anderson, Heating Equip.; G. L. Chesley, Mond Radiator; A. A. Marks, consulting engr.; E. T. Selig, Richmond; E. P. Hayes, E. R. Downe, C. A. Olsen Mfg.; D. J. Peterson, M-H; Loves, Carl Byoir & Assoc.; and I. N. Hunter, National Radiator.



finishphotos

SNAPSHOTS OF GAS APPLIANCE MANUFACTURERS

(see story in May issue of finish)



Edw. Martin, GAMA; A. F. Smith, A. O. Smith Corp.; H. M. Brundage, G-E; Geo. Boeddener, Nat'l Warm Air Heating & Air Cond. Assn.; I. E. Seith, W. Kresmer, Forest City Foundries; P. W. Collum, Temco; Fred Weldon, Gen. Controls; F. R. Hayde, Locke Stove.

Kent Wilson, M-H; J. V. Rerucha, A. A. Muenzer, Columbia Burner; H. M. Strong, Murray; James Mitchell, Grand; W. C. Davis, J. J. Brandt, Cribben & Sexton; John A. Fry, Detroit-Michigan; H. E. Jalass, Cribben & Sexton; and D. D. Piper, Norman Products.

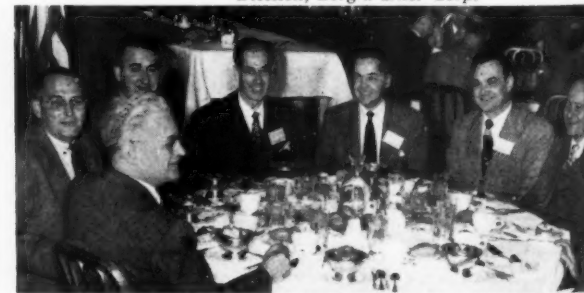


O. E. Loberg, Gurney Products; C. W. Nessell, M-H; W. M. Myler, Jace Combust.; H. Tiley, G. D. Sutherin, Caloric Stove; L. F. Kew, Retailing Daily; Hal Singleton, Grayson Control; C. W. Jernigan, Combustion Engr.; E. J. Horton, Frank Post, Robertshaw-Fulton Controls.

F. H. Flint, Ingersoll Products; G. H. McFadden, H. E. Thompson, Foundry & Mfg.; C. G. Weirs, General Gas Light; T. D. Bromley, Pless; Jack Tracy, M-H; C. M. Baker, Frank Nugent, Ingersoll Products Division, Borg-Warner Corp.



William Wildern, Detroit Brass; L. R. Mendelson, Hotstream; J. F. Donnelly, A. O. Smith Corp.; Edith F. Frey, GAMA; Robt. Borden, LPGA; R. W. Simpson, John Wood Co.; E. J. McFadden, Combustion Engr. Superheater; R. E. Imhoff, Detroit Brass; William Robinson, Ramler & Robinson.



R. A. Brackett, Spencer Turbine; James R. Lee, GAMA; B. L. Finn, Stock, Partlow; J. H. Sands, Eclipse Fuel Engr.; Howard Partlow, Wayne McGrew, Partlow; Frank J. Fieser, Fieser Co.; E. J. Harsh, Mid-Continent Metal; E. J. Funk, C. M. Kemp Mfg.



3M PLANT EXPANSION

Details of a \$6,500,000 plant expansion program were announced by officials of Minnesota Mining & Manufacturing Company recently, covering facilities in ten cities. R. P. Carlton, president, said the expansion will provide additional manufacturing and storage facilities for all of 3M's major production divisions.

GLIDDEN AWARD TO TOM ARMEL

Every year The Glidden Company presents "The Greater Glidden Award"



to one of its 900 salesmen for the outstanding performance during the previous year. This performance covers all phases of sales, solicitation, sales volume, ability to serve customers, general efficiency and cooperativeness.

During 1950 the Nubian Industrial Division made a new sales record and Thomas H. Armel of the Nubian organization has received the 1950 award.

A report from C. C. Johnson, regional director for Glidden's Nubian Division, says: "Tom Armel contributed a major part in this increase in sales. We are very proud of this fact and welcome this opportunity to pay tribute to him for his over-all excellence as the outstanding representative for The Glidden Company during 1950. He has contributed his technical knowledge and given much time and energy to the promotion of new developments in industrial paint, metal preparation, paint application methods, finishing

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systems and other phases of technical service. Tom Armel's business and sales ability and his many admirable personal qualities have earned for him the admiration and respect of everyone with whom he comes into contact. His loyalty and untiring efforts to be of service in a business way and helpful in personal matters, have won for him a host of friends. We feel that his many friends will wish to join us in congratulating Tom Armel on his very fine record of achievement", concluded Johnson.

BEDE CHICAGO OFFICE

Bede Products, Inc., manufacturer of paint heaters and other hot spray equipment, has opened a branch office in Chicago, headed by Harold C. Fornwall, district sales manager.

UNITED LACQUER EXPANSION

S. L. Cantor, vice president, United Lacquer Mfg. Corp., Linden, New Jersey, has announced the construction of an explosion-proof building which will add 4,000 square feet of manufacturing operations.

Cantor said the increased level of manufacturing operations in defense and non-defense industries made the addition necessary. Finishes particularly in demand now, he said, are rust inhibiting coatings and exposure-resistant enamels.

WHITING ON SURVEY TRIP

General Lawrence H. Whiting, president, American Furniture Mart, left recently on a 45-day, 26,000-mile flying trip to make a trade survey in 16 European countries. He will visit seven European trade fairs as trade adviser to the U.S. Department of Commerce, the Economic Cooperation Administration, and the American Furniture and Home Furnishing Industry.

ALLEGHENY LUDLUM REPORTS LARGEST SALES VOLUME

Allegheny Ludlum Steel Corporation reported sales volume of the first quarter of 1951 as the largest in the

firm's history. Sales and revenues during the quarter totaled \$57,917,747. Shipments in March reached an all-time high of \$21,320,343.

YOUNGSTOWN SALES AND PROFITS UP FOR FIRST QUARTER

Youngstown Sheet and Tube Company reported a 50 per cent gain in net sales and other revenues for the first quarter of 1951 over the same period of last year. Net income for the first quarter of 1951 amounted to \$8,530,142 on net sales and other revenues amounted to \$123,458,779. In the first quarter of 1950 the firm reported net profit of \$7,490,941 on net sales and other revenues amounting to \$79,604,228.

FINISH STAFF MEMBER

NOW IN SERVICE

Dana Chase, Jr., formerly manager of customer service for *finish* maga-



zine and a member of the active reserve of Uncle Sam's Army, has reported for active duty. He is now Lt. Dana Chase of Company H—2nd Bn., 87th Regiment—10th Infantry Div., and is stationed at Fort Riley, Kansas. We miss him at the *finish* offices and wish him the best of luck in the part all young and healthy men are called upon to play in today's uncertain world situation.

The office division of the work formerly supervised by Dana Chase, Jr., is now under the direction of Dolores Bates, formerly with the public relations department of Hotpoint, Inc.

more news →



don't play hide and
seek with *Quality!*

standardize your finish with . . .

MODERN PORCELAIN ENAMEL

A healthy appreciation of the possibilities of Porcelain Enamel has stimulated Pemco Research in the development of MODERN PORCELAIN ENAMEL FINISHES . . . FINISHES that as late as 10 years ago were thought impossible.

New Markets have been opened! New concepts of the flexibility of MODERN PORCELAIN ENAMELS have been established! New economies are being realized in application and production . . . *and no one yet will dare predict the limitations of further advances through RESEARCH!*

Constructive thinking in the development of even finer Porcelain Enamels is predicated on a better understanding of the possibilities OF TODAY'S MODERN PORCELAIN ENAMEL FINISHES.

EVEN IN A RESTRICTED ECONOMY SUCH AS NOW EXISTS these MODERN PORCELAIN ENAMELS are of such outstanding QUALITY that they set a new standard for comparison . . . a yardstick for measuring your production profits through the standardization of the Quality of your Finish.

These NEW PORCELAIN ENAMEL FINISHES are more durable . . . can be applied at less costly application weights . . . show greater resistance to abrasion . . . mature at lower temperatures . . . speed up production. Their advantages grow more pronounced with their use in YOUR PRODUCTION.

Keep abreast of the development of these MODERN FINISHES. Don't play hide and seek with QUALITY . . . standardize your FINISH with MODERN PORCELAIN ENAMELS by PEMCO. Get in step today—by wire or phone or letter . . . insist on proof of their superiority.



PEMCO CORPORATION

BALTIMORE 24, MARYLAND

ALWAY BEGIN WITH A GOOD FINISH

OTHER
Pemco
PRODUCTS



PORCELAIN
ENAMEL COLORS



GLAZE
FRITS



GLAZE
STAINS



GLASS
COLORS

And Other
Related Ceramic
Materials

PETERSON TO AMERICAN STOVE

Elliott Peterson, recently with Century Vitreous Enamel Co., has returned to American Stove Co., as ceramic engineer at the St. Louis plant. He had been employed at American Stove's plant in Harvey, Illinois, for 20 years until its closing several years ago, when he joined Century Vit.

American Wheelabrator & Equipment Corp. has announced that Stanley F. Krzeszewski, factory manager, is now also a vice president. He is also chairman of the Michiana Chapter of American Foundryman's Society.

PEMCO GETS ECA AWARD

Pemco Corporation has received a Marshall Plan Certificate of Cooperation for participation in the ECA Technical Assistance Program. Presented by Baltimore's Mayor D'Alessandro on behalf of ECA Administrator William C. Foster, the certifi-

cate was in recognition of assistance given to teams of visiting foreign experts studying U.S. industrial techniques. Similar awards were made to firms in 500 cities throughout the United States.

PEI ADOPTS SIGN STANDARDS

A comprehensive set of sign standards has been drawn up by the Specification Committee of the Porcelain Enamel Institute Sign Division and adopted by PEI members participating in sign manufacture. The standards cover all phases of porcelain enamel sign manufacture.

A short form, known as Specification No. 1, has also been adopted and is merely a reference to full standards for use in connection with drawings and estimates. A formal written guarantee based upon a normal 10-year service period has been approved by division members calling for restitution in case of faulty materials or workmanship on a service life basis, if occurring during the initial 10 years of service.

SKINNER, RICH, NEW

PHILCO VICE PRESIDENTS

Thomas A. Kennally, president, Philco Refrigeration Division, announced the appointment of James M. Skinner, Jr. as vice president-sales, and Ray A. Rich, vice president-products, for the division.

Skinner will be responsible for sales of Philco refrigerators, freezers and air conditioners, while Rich will be responsible for the design of the company's refrigerators, freezers, air conditioners, and electric ranges.

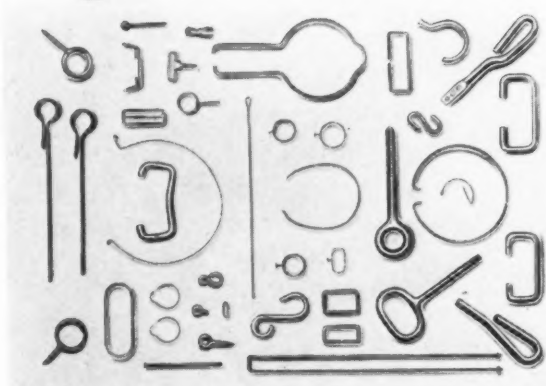
PHILCO FIRST QUARTER

SALES SETS NEW RECORD

Sales of Philco Corporation for the first quarter of 1951 totaled \$113,524,000 and set a new record for any quarter in the firm's history. William Balderston, president, announced. Balderston said Philco's government orders for advanced radar, electronic and ordnance equipment, research and development programs, and training work approximate \$100,000.

WIRE FORMS & ASSEMBLIES

Stampings • Metal Fabrications



Facilities for **DEFENSE WORK**

- Automatic Wire Forming
- Wire Rings—full range
- Eye Wires—formed, welded, special shape
- Wire Assemblies—baskets, dish drainers, strainers
- Welding—butt, multiple spot—torch welding
- Roll threading—machine threads, log threads, special knurling
- Stampings—blank and forming dies, hydraulic presses, wire flattening and bending
- Finishing—all metal finishes, rubber and plastic coating

THE WASHBURN COMPANY

WORCESTER, MASS. ROCKFORD, ILL.

SPARKS-WITHINGTON MAKES REFRIGERATOR



Henry L. Pierce, gen. sales mgr., Radio-Television Div. of Sparks-Withington Co., Jackson, Mich., has announced that his company will market a short line of electric refrigerators through Sparton's exclusive dealers under the Sparton "cooperative merchandising plan."

PERMA-VIEW *"eminently satisfactory"* for CROSLEY ranges

HERE'S WHAT THE CROSLEY DIVISION, AVCO MANUFACTURING CORP., THINKS OF PERMA-VIEW WINDOWS:

"Use of Perma-View oven door windows in the top model of our 1951 line of Crosley electric ranges has proved eminently satisfactory.

"Installation is simple, and the fact that we have had few or no service calls related to the windows is evidence of excellent performance in homes throughout America.

"The oven door window is a feature which has a strong appeal to housewives, and it definitely adds to the sales appeal of the ranges in which it is incorporated."

PERMA-VIEW is adding sales appeal to the top lines of more and more range manufacturers. Our engineering department will show you how easily PERMA-VIEW windows can be adapted to your range doors. Phone, write, or wire for contact.

"OUT OF OUR CARTON—INTO YOUR DOOR"
It's as simple as that!



MILLS ENGINEERING COMPANY
3683 EAST WILLIS DETROIT-7-MICHIGAN

finish JUNE • 1951

000. Plans for a new plant at Frederick, Md., for manufacture of electronic tubes are underway, and construction has already begun on a plant for government work opposite Philco headquarters in Philadelphia.

BINKS ADDS PUMP DIVISION

Binks Manufacturing Company, Chicago, makers of spray painting and finishing equipment, has added a Pump Division, Burke B. Roche,

president, announced. Karl W. Osterstrom, specialist in the design and development of air-operated hydraulic pumps has been appointed manager of the new division, in charge of sales, engineering and development.

CENTRAL DIST. ENAMELERS

ELECT OFFICERS

The May meeting of the Central District Enamelers Club was held at Hotel Allerton, Cleveland, Ohio, on

May 4. There were 53 persons in attendance with two speakers, E. W. Dany, Ferro Enamel Corporation, who talked on "Modern Porcelain Enamel Furnace Design", and R. D. Beck, Binks Mfg. Co., Chicago, who talked on "Low Pressure Spraying".

Election of officers was held at this meeting, and the following elected:

Jack Swartz, Westinghouse Electric Corp., Mansfield, Ohio, president; Richard Hammell, Tappan Stove Co., Mansfield, Ohio, first vice president; H.L. Rodgers, Alliance Ware, Alliance, Ohio, second vice president; and M. Bozsai, Ferro Enamel Corp., Cleveland, Ohio, secretary-treasurer.

This concluded the current season of meetings under the old officers. The Fall season will begin in September with the annual Golf Party and Clam Bake.

TWO NEW VICE PRESIDENTS

AT DETROIT BRASS

At a recent board of directors meeting, R. L. O'Brien, president, Detroit Brass & Malleable Works, announced



WILLIAM WILDERN

the appointment of two new vice presidents. They are O. H. Welke, in charge of the Malleable Division, at Wyandotte, Mich., and William J. Wildern, Jr., in charge of the Brass Division, at Detroit.

Welke, a mechanical engineer graduate of the University of Michigan, has been with the company thirty years.

Wildern attended the University of Michigan also, and joined Detroit

PRODUCTION FOR DEFENSE OR ESSENTIAL CIVILIAN REQUIREMENTS

The facilities and the 50 years experience of Detroit Brass are available to you on your DO-RATED PROGRAM

If your program specifies brass machined parts or brass components, we suggest you consider the experience, capacity and dependability of your proposed source of supply.

If your components are to be produced from forgings, from extrusions or from castings, we offer you prompt production to meet schedule requirements.

If close tolerances are demanded—if familiarity with government specifications is desirable, you can be assured of special assistance in furthering your program by sending your inquiries to Detroit Brass.

DETROIT BRASS & MALLEABLE WORKS
SPECIALTIES DIVISION
DETROIT 9, MICHIGAN

AT YOUR SERVICE IN THE NATIONAL EMERGENCY

Brass in 1940. He is executive officer of the Gas Valve Division of GAMA.

"BART" FENNESSY DIES

At press time we learned of the untimely death of Barton E. Fennessy,



of Oak Park, Ill., associated with Metalloy Corporation, Minneapolis, Minn. He died Sunday, May 20, at Hines Hospital, Chicago. He recently was transferred from St. Mary's Hospital, Rochester, Minn., following an extended illness.

"Bart" was very well known in the porcelain enameling and ceramic industries where he spent approximately a quarter of a century. Earlier connections were with The Harshaw Chemical Co. and The O. Hommel Co.

ENAMELING INDUSTRY

COORDINATING COMMITTEE MEETS

During a recent meeting of the Porcelain Enameling Industry Coordinating Committee, a review was made of the progress attained in dissemination and interchange of information between the various Enamelers Clubs. It was reported that clubs are now cooperating in mailing of advance programs and reports or minutes following each meeting.

A poll showed unanimous agreement that, while there were no current projects of prime importance, the semi-annual get-together of representatives from all important enameling organizations had proved

finish JUNE • 1951

mutually beneficial and should be continued. It was planned to schedule the next meeting of the coordinating committee as a luncheon to be held in the new Union Building at Ohio State during the PEI Forum.

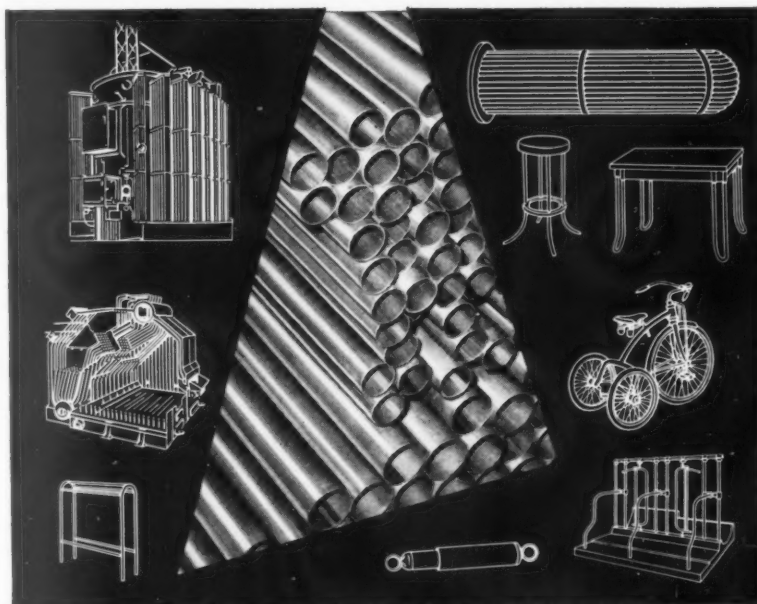
FOOTE MINERAL'S 75TH YEAR; SALES UP 50% OVER LAST YEAR

At the seventy-fifth anniversary and stockholders meeting held in Philadelphia recently, H. C. Meyer, president of Foote Mineral Company, reported company sales up 50% over 1950. Greater industrial use of lithium in consumer products was one of the main factors for the increase, it was stated.

The company was founded by Dr. A. E. Foote, a collector of rare ore and minerals. At the Philadelphia Centennial in 1876, Dr. Foote's exhibit attracted so much attention that he resigned a professorship at Iowa State College and devoted his full time to collecting and supplying mineral specimens. In 1900, under the direction of Warren M. Foote, son of the founder, Foote Mineral entered into its first contract to supply ores in commercial quantities.

NEW TITANIUM FIRM

P. R. Mallory & Co., Inc., and Sharon Steel Corp. have jointly formed Mallory-Sharon Titanium



WHY MORE AND MORE TUBING MADE "The Yoder Way" GOES INTO THINGS DESIGNED TO STAY

Since Yoder in 1939 introduced their first electric-weld tube mills, high quality tubing at low cost has become available in quantities heretofore undreamed of.

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Corp. to develop, produce and market titanium and its alloys.

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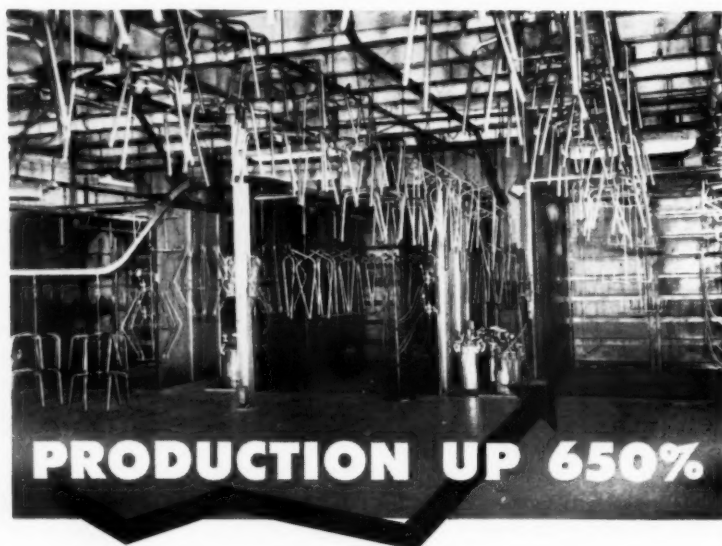
American Stove Company reported a net profit of \$433,792 for the first quarter of 1951. Sales for the quarter consisted entirely of gas ranges, gas and oil space heaters and commercial cooking equipment, all consumer products. However, Arthur Stockstrom, president, announced that pro-

duction on three defense contracts will begin within the next four months. The contracts cover rocket head assemblies for Army Ordnance, fire bombs for the Air Force, and wing tanks for fighter planes.

PENNSALT TO EXPAND

CAPACITY 23%

Pennsylvania Salt Manufacturing Co. is in the process of expanding its total tonnage capacity by 23 per cent.



Rate of production jumped 650% when one eastern manufacturer of metal furniture switched from hand spray to a conveyORIZED system and RANSBURG ELECTRO-SPRAY. The modern electro-spray process enables this manufacturer to do in a little over 2 hours what formerly required 16 hours!

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Electrostatic Painting Processes

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RANSBURG

George B. Beitzel, president, reported, Beitzel said first quarter sales totaled \$12,432,366, a gain of 33 per cent over sales for the same period of 1950.

During 1950 Pennsalt reported approximately \$4,100,000 spent on expansion and improvement. Beitzel said in addition the following expansion is planned: facilities at Portland to increase the company's capacity for output of alkaline cleaners by 30 per cent; a \$96,000 office building to be built at the Portland plant; 30 per cent increase of production of chlorine and caustic soda at Tacoma; 15 per cent increase of production of caustic soda and 20 per cent increase of alkaline cleaners at Wyandotte, Mich.; 50 per cent increase in capacity for refining Kryolith at Natrona, Pa.; 33 per cent capacity expansion for hydrofluoric and anhydrous hydrofluoric acid production at Calvert City, Ky.

ESTATE APPOINTMENT

Will Hemsworth has been appointed division manager of the Chicago area for The Estate Stove Company, a subsidiary of Noma Electric Corp., Hamilton, Ohio, it was announced by Gordon P. Hentz, general sales manager. Hemsworth was previously associated with Camfield Manufacturing Company and Montgomery Ward.

FARRELL PURCHASING HEATERS AND RANGES FOR SEARS

Sears, Roebuck and Company announced the appointment of Richard J. Farrell as buyer of gas, electric, bungalow and kitchen heaters. He will also continue handling oil, bungalow and combination range purchase. Assisting Farrell will be James S. Goodpasture and Ben A. Compton.

FORMER ACS PRESIDENT

JOINS FERRO

J. W. Hepplewhite, who has just completed his term as 52nd president of American Ceramic Society, has been added to the staff of Ferro Enamel Corporation, Cleveland, Ohio, it has been announced by Dr. J. T.

Robson, vice president in charge of Allied Engineering Division of Ferro.

PEI LAUNCHES "OPERATIONS PORCELAIN"

The Porcelain Enamel Institute's recently launched "Operations Porcelain" is already proving its effectiveness as an aid to porcelain enamellers throughout the country in converting to defense work. Under the guidance of the recently created PEI Government Business Committee headed by P. B. McBride, Porcelain Metals Corp., Louisville, and the staff of the Institute's Washington headquarters, primary functions of the operation have been to relay information regarding prime and sub-contracts to and from government procurement offices and to lay the groundwork for a complete analysis of the enameling industry's defense work potentialities.

The majority of enamellers, it is pointed out, are too small as individual firms for early government recognition as potential prime-contractors, yet are faced with increasing scarcities of essential enameling materials as well as shrinking civilian markets due to limitation orders. The Government Business Committee, therefore, is arming PEI members with "know-how" and organization with which to combat this situation. Through constant contact with government procurement offices the Committee is keeping procurement officers familiar with latest information on porcelain enamel and the industry's production facilities. In addition, the Committee has informed PEI member companies of the persons to contact in government procurement offices and periodically disseminates data on new contract bid availabilities and lists of prime contracts let, to facilitate follow-up in obtaining sub-contract work.

The Government Business Committee is also studying the possibility of converting various porcelain enameling facilities to defense sub-contract work not necessarily related to usual enameling processes. First possibility to be investigated is that of converting box type enameling furnaces to controlled atmosphere

furnaces, used chiefly for heat treating of metals. The Committee will also investigate use of open end continuous furnaces without conversion to atmosphere control, for ordinary annealing and spheroidizing of light metal parts or for such applications as copper brazing. The Committee also points out that the complete automatic or manual spraying set-ups maintained by porcelain enamellers could serve just as well, with minimum conversion, for paints and syn-

thetic enamels. "Baked on" finishes could be hardened in low temperature furnaces now used for removing water from porcelain enamel coatings prior to fusing.

PRODUCTION OF SILICONES TO BE EXPANDED THIS YEAR

The production of silicones will be expanded here and abroad in 1951, it was forecast by R. O. Sauer, section engineer on silicone products for General Electric Chemical Depart-

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ment, in a talk before the Chicago section of the American Chemical Society.

Sauer said at present only three companies, including G.E., manufacture silicones on a sizeable scale and estimated that these companies produced several thousand tons of silicone products last year. The increase in the number of patents issued in this field since 1940, Sauer said, shows a growing interest in silicones and indicates that they are now beginning to take an important place in industrial chemistry.

TOWNE HEADS MICHIGAN OVEN

The appointment of A. C. Towne, Jr., as president, Michigan Oven Company, was recently announced. Towne is one of the firm's founders and had been serving as Buffalo District Manager and member of the board. William Jarvis, formerly associated with Young Brothers Company and Detroit Sheet Metal Company, was named general manager. The firm manufactures industrial ovens for electrical, foundry, heat treating and other industries.

NORGE REFRIGERATORS

PRODUCED IN BRAZIL

Initial production of Norge, White Star and Alaska domestic refrigerators, all products of Borg-Warner Corporation, has been begun by Cia. Distribuidora Geral Brasmotor near Sao Paulo, Brazil, in what is believed to be the first production of American household refrigerators in Brazil.

Announcement of the opening of the plant was made jointly by George P. F. Smith, president, Norge Division of Borg-Warner; J. W. DeLind, Jr., president, Borg-Warner International Corp.; and Miguel Etchenique, president, Brasmotor.

Capacity of the plant is reported to Page 84 →

Determination of opacity . . .

→ from Page 31

Some of the test cylinders were then sawed to determine how thin the sections could be easily and satisfactorily be cut. It was easy to cut discs 0.07" without any tendency toward cracking or chipping. In order

to eliminate the scratched surface left on the discs by the diamond saw, it was decided that the surfaces of each disc would be polished until a uniform surface was obtained. To both surfaces was then applied an index oil (1.6) near that of the glass and there resulted a surface perfectly clear and smooth, presenting no interference to light transmission. The entire disc preparation, although several steps were involved, was one which required no longer than 60 seconds per disc.

Since this method of preparation was so different from that of the preparation of an enamel on metal, it was thought advantageous to investigate the probability of these results representing the conditions actually present in the enamel when on metal. Tinsley² stated that in enamels containing titanium dioxide, opacity was caused by the recrystallization of the titanium dioxide from the quenched frit. It was further stated that when a frit was quenched and then reheated to enameling temperatures that the same degree of opacity was obtained as when the frit was

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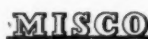
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allowed to cool down slowly from 2000-2300°F. Therefore, it was thought that these results would probably be comparable with those actually present on the enameled metal.

Thus with the difficulties in the preparation of the specimen eliminated, the way was open to investigate the effect of variation in opacifier on the actual opacity of the enamel as determined by a translucency meter.

Experimental procedure

Due to the limited time available for this investigation, it was decided that only one enamel frit would be prepared and that it would be a frit containing titanium dioxide as the opacifier. A titanium enamel was selected, since the present trend seems to be toward titania opacified enamels, and also titania produces opacity by recrystallization, which could be observed.

Friedberg and Petersen⁸ made an extensive composition study of titania enamels and their results pointed to small areas of enamel compositions that showed promise as titania cover

enamels. Specifically, their enamel Y12 was the composition demonstrating to a high degree the properties requisite for a kitchenware white cover coat. This enamel was, therefore, thought to be a good one on which to base this investigation. The melted composition of Y12 was taken and the TiO_2 eliminated and the following was the calculated enamel composition:

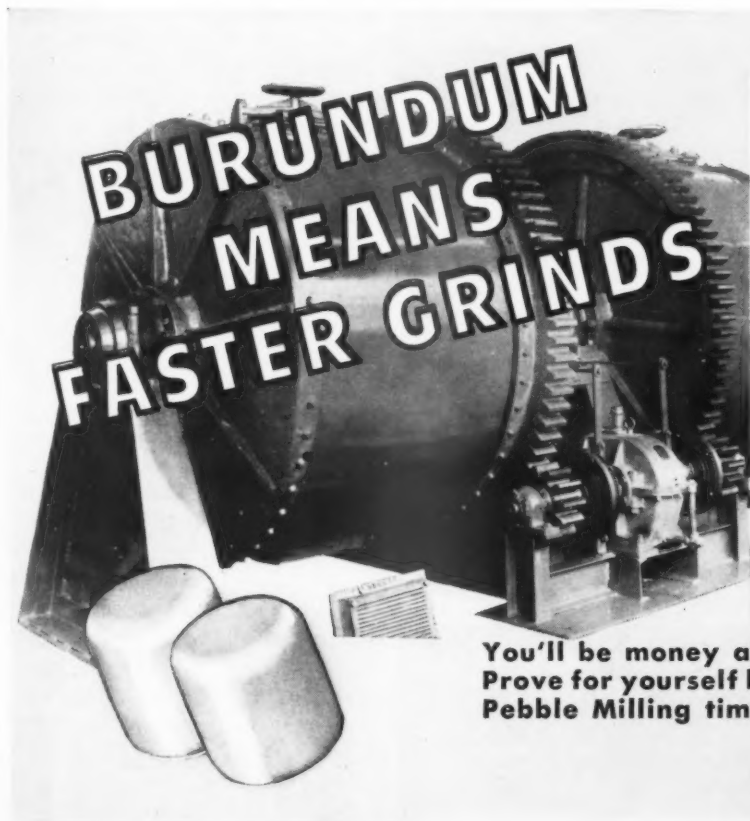
Dehydrated borax26.4%
Borac acid 4.3
Soda niter 2.5
Potassium niter 8.6
Quartz48.8
Sodium silicofluoride	... 9.5

On the basis of melted oxide composition titania was added in the amounts of 5, 10, 12, 14, 16 and 18%; 18% being the amount present in the original enamel Y12.

A 2000-gram batch was weighed to an accuracy of 1 gram. The enamel was then made to pass a No. 16 screen, thoroughly mixed for a period of 15 minutes, and passed twice through a No. 12 screen. The required amount of titania to prepare

100 grams of melted frit of each of the frits containing the various amounts of titania mentioned before was weighed out and placed in suitable jars, to which the enamel was added. The titania was then thoroughly mixed with the enamel by placing them in a mortar and grinding them until a uniformity of color existed. Each enamel was then ready for fritting. A small gas-fired furnace was used to frit the various samples, since it was well adapted to the small crucibles in which the 100-gram samples were smelted. The crucible was heated to a temperature of 2150°F. and the enamel introduced. It was found that a liquid glass was present at 2150°F. and that by keeping the frit at that temperature for a period of 20 minutes, a clear, bubble-free glass resulted. Therefore, the temperature of 2150°F. and the time of 20 minutes were held constant throughout this investigation.

Two cylinders of each frit were cast and placed in the annealing furnace in an appropriate base so that they would remain in an upright po-



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sition (Figure 3). As mentioned previously, the temperature of this furnace was 1000°F., and the cooling period 15 hours. However, after the cylinders had cooled, it was evident that in no enamel was there any trace of opacity, indication that the temperature range of recrystallization had been covered too rapidly, probably in the mold.

In order to determine the temperature of recrystallization, the cylinders were reheated slowly, and as the

temperature rose above 1000°F. they were continually under observation. It was noted that at 1150°F., crystallization became evident and the growth was actually observed descending from the top throughout the glass to the bottom. It was also noted that just above this temperature, 1175-1200°F., the cylinders began to slump slightly. The temperature of 1150°F. was held for a period of 2 hours in order to obtain uniform crystallization. By visual observa-

tions it was noted that all opacity was obtained between 12 and 16% titania, so additional frits were prepared in which titania was varied in one percent increments between 13 and 17% titania. These cylinders were placed in the furnace at 1000°F. until the last cylinder was cast, and then the furnace temperature was raised to 1150°F. and that temperature maintained for a period of 2 hours to insure uniform crystallization. After cooling, the discs were prepared as outlined previously and the results plotted on Graph 1.

Since zinc oxide had been mentioned by Tinsley, as helpful in increasing the opacity of titania enamels and was usually used in the amount of one-half the titania content, it was decided to add zinc oxide to the enamel containing 13% titania in the amounts of 4, 6, 8 and 10%. The results of the effect of zinc oxide are shown on Graph 2. The enamel containing 13% titania was chosen, since it was the one just at the point of obtaining opacity, and was, therefore, probably saturated with dissolved titania.

In order to determine the effect of the length of soaking period on the opacity, an additional sample of the enamel containing 16% titania was prepared and soaked for a period of 4 hours. The opacity of this enamel is plotted on Graph 1 and may be compared with the same enamel soaked for 2 hours.

Discussion of results

Before discussing the results, it must first be understood that they cannot be taken as absolute values since standardization of procedure was not attempted in this investigation.

Graph 1 indicated that the range of opacity covered by this investigation was a large one, being developed primarily between 14 and 16%, which was in agreement with the visual observations discussed previously. It was also evident that the capacity depended upon the duration of the soaking period at the recrystallization temperature. The frit with 16% titania which was soaked for a period of four hours was decidedly



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more opaque than the one soaked for two hours, and even more opaque than the frit containing 17% titania soaked for the regular 2-hour period.

Graph 2 was an indication of the effect of zinc oxide added to the frit containing 13% titania. As was expected, the opacity increased with an increase in zinc oxide. The fact that the curve representing 10% zinc oxide crossed the one representing 8% zinc oxide should not be taken as an absolute characteristic of the frit. This would have indicated that in the range of thickness of enamel coating on metal that the enamel with 3% zinc oxide would be more opaque than the one containing 10%. This was probably due to experimental error.

It would be appropriate at this point to discuss the observed color of the enamel with zinc oxide. With 4% zinc oxide, the texture of the cylinder was that of marble, and with 6% the inclusions in the texture were a decided blue. However, with 8% zinc oxide, a smooth white color resulted, and with 10% the color was uniform and smooth, but a definite blue tint was apparent which destroyed the white color altogether.

A mention of Graph 3 is all that is needed. The desired "S"-type curve was very sharp and reached a peak within a range of only a few percent opacifier as was predicted. As for the curve representing zinc oxide addition, opacity was obtained immediately with 4% zinc oxide and only an increase in opacity above this amount is indicated. In all cases, the thickness upon which changes in translucency were measured was 0.008", which was considered within the range of thickness of an enamel on metal.

Conclusions

The process of forming the glass cylinders was one which could be used in industry to prepare draw trials of a frit at any time during the smelting operation, and should, therefore, lend itself to methods of control as well as experimental determination. Mere visual observations of the cooled cylinder were of considerable aid in determining what temperature

and what period of time produced a clear bubble-free glass.

Continuous checks on the opacity of a frit could be maintained in the plant and any change in temperature or materials would be indicated and recognized before the change could get out of hand, or be detrimental to the appearance of the enameled ware.

In conclusion, it was thought that this method might be standardized to produce reliable, reproducible re-

sults. Therefore, it should be of considerable aid to the enamelist in his decision as to the least amount of opacifier to produce maximum opacity.

¹ Jour. Amer. Ceram. Soc. 30 (5) 153-159 (1947).

² S. G. Tinsley "Titanium Oxide as Ingredient of Porcelain-Enamel Frits," Ceramic Industry, 38 (3) 36-39 1942.

³ A. L. Friedberg and F. A. Petersen, "Systematic Study of Simple Titania-Bearing Porcelain Enamels" Journal of the American Ceramic Society 33 (1) 17-24, 1950.

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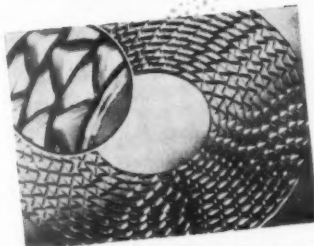
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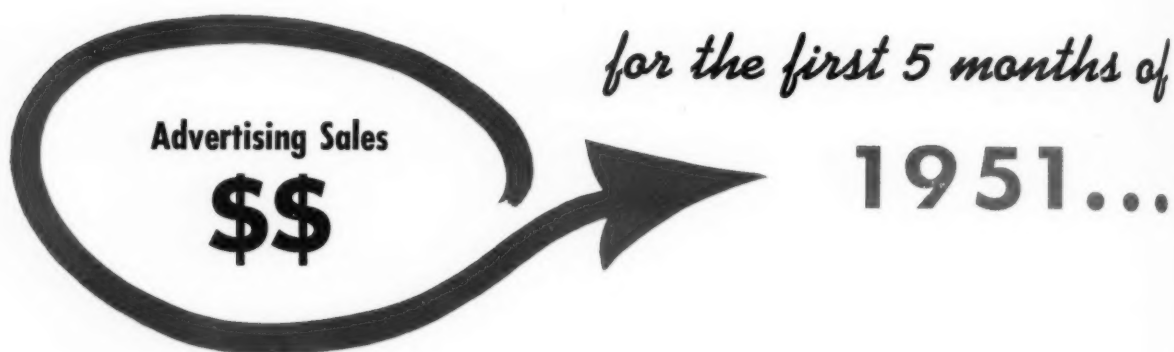
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New Supplies and Equipment

F-10. Special waxes used as metal working lubricants

Production tests, conducted in a variety of metal working plants, show

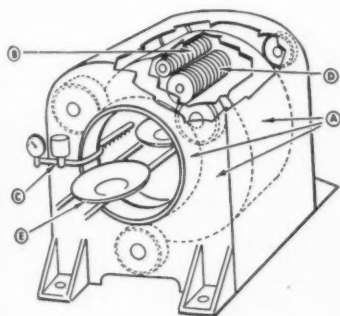


that special blends of waxes used as metal working lubricants permit the drawing of stainless steel far beyond its theoretical capacity. Wax blends are also proving useful in the drawing of aluminum. Metal fabricators find that the use of wax as a lubricant extends the life of tools and dies and in some cases eliminates degreasing operations.

A large electrical manufacturing plant found that blanks of #405 stainless steel can be successfully drawn (see photo) 50% beyond the theoretical capacity of the metal.

F-11. New coating process

A new concept in industrial coating is said to offer great saving in time, money, and material. The new proc-



ess is said to apply a full coverage coating of from .0008 to .025 inch thickness of any coating material in one passage, at high speed. The process is said to be adaptable for coating electronic parts, bulky metals products, delicate electrical relays, ceramics, etc.

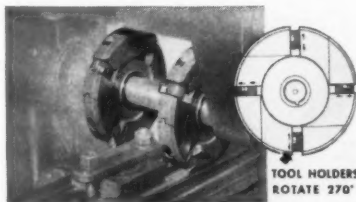
The operation of the machine shown is as follows: Coating ma-

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For more information on new supplies, equipment and literature reviewed here, fill out the order form on page 64, or write to us on your company stationery.

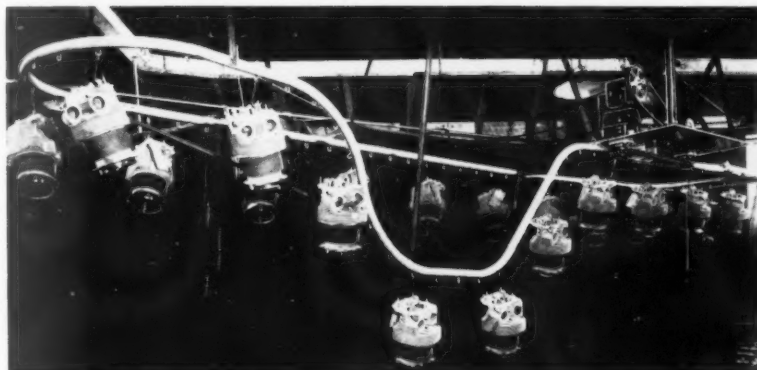
terial fed from external source through feedline "C" to the annulus of rotating bowl "A". Rotation of bowl carries material to feeding rotor "B" which is driven by the fluid friction of the coating material. Rotor "B" throws the material centrifugally into the surface of the high speed rotor "D" which atomizes the material into a fine mist and floats it onto the work passing through the bowl on conveyor "E". The overspray is caught by the bowl and returned to the annulus in its former fluid condition.

F-12. New unit permits four to six cuts in one operation



This fly cutter permits four to six cuts from 3/16" to 2" in width in

F-14. Light capacity power-driven overhead conveyor

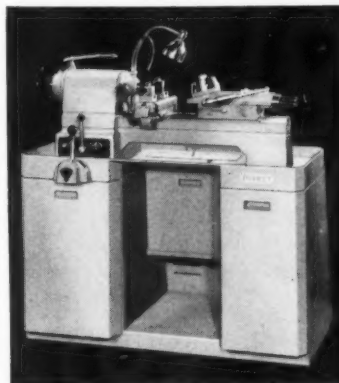


A new light capacity, power-driven, overhead chain conveyor is extremely flexible and its short, radius curves and track sections are easily combined so that changes or

one operation for many types of milling, including steel, light metals and plastics. Individual adjustment allows several cuts to be made in one operation. Special cutters for each job are unnecessary.

F-13. New turret lathe

A turret lathe featuring toolroom precision is a 9" swing machine for



fast production of small duplicate parts to interchangeable limits. Grouped controls permit instant selection of variable cutting speeds from 90 to 3750 rpm, and a convenient automatic chuck closer, with switch, controls spindle drive and brake. Spindle is dynamically balanced on super-precision grease-sealed ball bearings, mounted to incur no thermal stresses.

additions can be made in a fraction of the time customarily required.

The "Chain-Veyor" will handle loads up to 30 pounds on each pendant spaced at six-inch intervals,

or 60-pound loads can be carried at 12-inch intervals when supported by two pendants fitted with cross-bar attachment.

Instant adjustment of conveyor speeds of from 3 to 9 feet per minute, while conveyor is in operation is made possible by a varispeed drive which is on all standard power units. Higher or lower speed ranges are available on special order at no additional cost. It is stated that any combination of turns are possible by joining horizontal, vertical top and vertical bottom curves together.

F-16. "Defense" version of continuous cleaning and pickling process

A new process which cleans steel cartridge cases 50 per cent faster than conventional methods is said to be an important step in the manufacture of shells for the Ordnance Corps.

The new system is a "defense" version of a continuous process for cleaning and pickling steel used commercially to mass-produce such metal articles as bathtubs, refrigerator liners, panels for electric and gas stoves, fluorescent light reflectors, and

automatic washing machine liners and tubs.

Switched by re-design to production for defense, the new system handles the larger size of artillery and mortar shell cases at a high production rate. Development of the new process is said to be especially significant at this time, because, due to the critical copper supply, most larger calibre ammunition produced in the United States in the future will be made with steel cases rather than brass.

F-15. Webbing straps with instant-set buckle grips

Webbing straps equipped with instant-set, instant-release buckle grips are materially speeding up all types of production, assembly, and material handling work. Among the diverse applications which have been reported for these straps are: holding bulky equipment on dollies, securing scaffolds on airplane fuselages, tying down automobiles in transit, and holding cylindrical and irregular shapes during assembly operations.

Due to a special buckle grip, the straps can be quickly set with any desired degree of tension, yet can be instantly released. Once set, the buckle prevents any slippage or backlash. The strap assemblies are available in 1", 1½", and 2" widths with optional end fittings and hooks of many styles.



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City _____ Zone _____ State _____

NEW LITERATURE

601. "Heavy Duty Cleaning"

Four metal cleaners are discussed in a new booklet, "Heavy Duty Cleaning—The Fast Way." The booklet was especially designed to explain how and why operating time can be cut, and cleaner costs lowered, for heavy duty metal cleaning. It points out types of soil removed, and the physical and chemical methods used in their removal. Cleaners for removing buffing and drawing compounds, for oil, fat and grease removal and for use in pressure-spray washers are discussed.

602. "Industrial Ventilation"

A new periodical, "Industrial Ventilation," is devoted to latest developments in industrial dust and fume control. Of special interest to ventilation engineers is informative technical discussion on the collecting efficiencies of cloth-type filters.

603. Two-color bulletin on portable soft abrasive blast cleaning

A new 4-page, 2-color bulletin covers a portable soft abrasive blast cleaning machine. Illustrated with six photos and one line drawing, the bulletin tells how such grits as corn cobs, walnut shells, peach pits, sawdust, etc., are used to blast grease and dirt from machines and parts (large motors to small gears) without damaging the surface material of the machine or part.

June • 1951

safe transit

FROM ASSEMBLY LINE TO FINAL CUSTOMER

THE ONLY SOURCE *for* ALL THESE QUALITY BOXES *and* CRATES

**For Domestic or Export
For Peace or Defense**

Nailed

Hinge corner

Wirebound

Cleated Plywood or Cleated Craveneer

Cleated Corrugated

(Sectional, Hinged and Watkins Types)

Our designing and testing laboratory,
supervised by experienced engineers, can assist you with
your packing problems, and is at your service without
obligation.

A National Safe Transit Certified Laboratory

CHICAGO MILL AND LUMBER COMPANY

33 South Clark Street

Chicago 3, Illinois

Plants at: Helena, Arkansas
Tallulah, Louisiana

• Greenville, Mississippi
• South Fork, Colorado

• Rockmart, Georgia
• Chicago, Illinois

safe transit

A monthly trade publication section devoted to improved packaging and shipping and materials handling practices in the home appliance and allied metal products field.

Plant experience information for all executives and plant men interested in the problem of packaging and shipping improvement and loss prevention.

Complete information on the National Safe Transit pre-shipment testing program for packaged finished products, and detailed progress reports of divisions and sub-committees of the National Safe Transit Committee.

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DANA CHASE PUBLICATIONS
PRINTED IN U.S.A.



Army lockers being crated for shipment—at Renown Stove plant. Lockers are crated in sets of three single and batteries of five. Operations shown include packing, closing crates, and application of strapping. For full report of locker production, see feature article starting on Page 21.

In conveyORIZED shipping room—at Kuehne Manufacturing Co. plant, Mattoon, Illinois. W. B. Tripp, chief engineer, Henry Sewell, shipping & traffic manager, and H. W. Williams, product engineer, inspect a packaged dinette set to which a Safe Transit Label has been affixed (also note NST Placard on side of boxcar). "Using the NST Label on our package calls the customer's attention to the fact that Kuehne is always striving to produce a better product in a better package," says Mr. Williams.



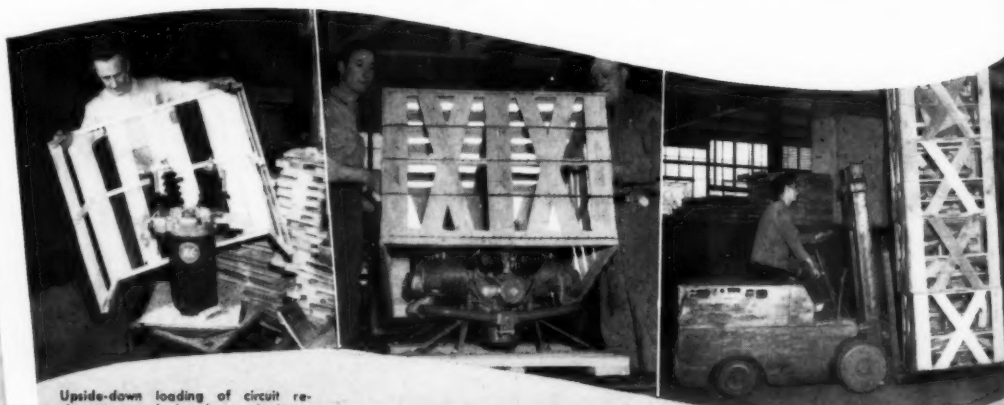
Now, more than ever before...

YOU NEED THE PROTECTION OF WIREBOUND BOXES and CRATES

Losses due to container failure have no place in an industrial economy facing material allocations and shortages. That's why you should investigate *Wirebounds*—which combine the strength of steel with thinner wood to bring you *better product protection at lower cost*. Three hundred graduate engineers of the Wire-

bound Institute have been technically trained to design tailor-made *Wirebounds* which assure damage-free product delivery. The value of this container engineering is clearly demonstrated in the following case histories. We will be glad to show you how these benefits apply to *your product*. Use the coupon below.

YOU CAN CUT DAMAGE CLAIMS LIKE THIS:



Upside-down loading of circuit reclosers caused breakage, leakage, sometimes irreparable damage in handling and transit. Since switching to Wirebounds, company reports damage claims have become negligible.

Using Wirebounds designed to "float" 400 lb. precision engines, this manufacturer chalked up a record of 3000 shipments in fifteen months without a single instance of damage in transit due to container failure.

Flexible power saw maker reduced shipping weight from 820 to 775 pounds, cut crating time 30%. Company stacks and handles units four high. Shipping damage due to container failure has been completely eliminated.

**Wirebound
BOXES & CRATES**

choose your course of action...

- ☐ Send me general information... complete descriptive book titled "What to Expect from Wirebounds."
- ☐ Send me specific information... tear sheets of case histories of packing products similar to mine.
- ☐ Give me direct action send an Institute trained sales engineer to show the advantages of Wirebound packing for my own product.

NAME _____ POSITION _____

FIRM _____

STREET AND NUMBER _____

CITY _____ ZONE _____ STATE _____

OUR PRODUCT IS _____ IT WEIGHS _____

mail now to WIREBOUND BOX MANUFACTURERS ASSOC.
Room 1154—327 South LaSalle Street, Chicago 4, Illinois

Users names on request

Research work is leading to better carloading methods

test information and practical results of extensive carloading
and load testing experiments

by *A. N. Perry* • FIELD RESEARCH AND ENGINEERING, SIGNODE STEEL STRAPPING COMPANY, CHICAGO;
MEMBER, LOADING RESEARCH DIVISION, NATIONAL SAFE TRANSIT COMMITTEE

finish

Through frequent contacts, we suppliers know that appliance manufacturers realize that their production lines do not end inside their plants. Bitter experience has taught them that families who buy their products hold them accountable for every nick, scratch and discoloration.

However, protection for anything as basic as dealer and customer good will demands an active program for

safety of products in transit. Much has been done already. Manufacturers individually have set up safe transit programs in their own plants. Group action, through associations such as the National Safe Transit Committee, has accomplished still more. And suppliers of materials handling equipment, containers, and packaging and reinforcing materials have provided valuable information through laboratory and field research, from which have come basic principles widely used today.

The most helpful ally any manu-

facturer with a packaging and shipping problem can have is the trained technician in the employ of a supplier. Most suppliers have highly trained engineers, capable of diagnosing many packaging and shipping problems, as well as seeing to it that their customers are supplied with the right materials. But there are occasions when packaging and shipping problems require more time and knowledge for solution. It is then

to Page 72 →

Case histories →

This 315-foot length of standard railroad track, a chronograph, tripper car, weighted bumper car, and a standard boxcar with the siding removed from one side for observation, comprise the equipment used on the Signode test track.



CASE HISTORY NO. I

A. O. Smith Corp., Kankakee, Ill.



Note breakage at top of crates caused by thrust of shorter containers against a vulnerable spot.

containers of different sizes, stowed without protection of separators, will cause damage to loadings

the use of diagonal strapping on the sides of high loads will prevent tilting when using floating load method

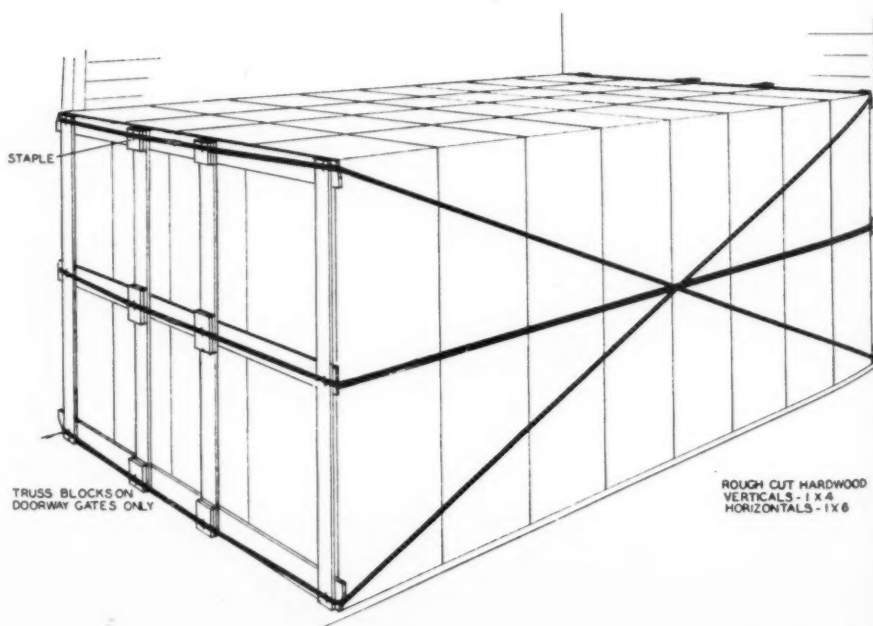
UP until early in 1948, the A. O. Smith Corporation, Kankakee, Illinois, plant had considerable difficulty with transit damage on their carload shipments of water heaters when loaded and braced in the rail car in the conventional manner.

Test loads indicated that a "floating load" type of carloading, plus properly designed gates, in cases where varying heights of heaters were loaded together, gave greatly improved performance. Such improved loading and strapping have reduced carload transit damage to a negligible amount.

Note: More case histories will appear in the July issue of *finish*.

FLOATING LOAD
WATER HEATERS AND OTHER HIGH LOADS

Before the car was loaded solidly, wall-to-wall, 1 1/4" x .035" strapping was draped along the sides of the car. The strap from the top of the load was brought down to the bottom of the gate. The bottom strap was brought upward to the top of the gate. The center strap was tensioned first over truss blocks, and the diagonals next in the same manner. The result was a firm floating load which prevented the damaging thrust of the small containers against the larger ones.



showing principle of reinforcing the center of a load to guard against center thrust or movement of a load upon impact, particularly at top of load

CASE HISTORY NO. II

Hotpoint Inc., Chicago, Illinois

AFTER the war, Hotpoint's carload shipments of electric ranges showed a high rate of damage. The company's packaging and shipping men began to survey shipping practices, and check shipments at destination. The damage was greatly reduced, but the results were not completely satisfactory.

It was proposed that controlled experiments on the test track be made. The customary test routines were followed and observations soon revealed that one of the prime causes of damage was a basic weakness in the top horizontal cleat on the crate. The container manufacturer, whose representative was present during the test runs, remedied the defect. This illustrates the principle that although containers may prove tops in performance separately, complete load testing should be considered prior to adoption. Attention was turned next toward improving methods of blocking and bracing the loads, and to improving the construction of the gates. A special method of strapping to reinforce the center section of the gate, using over and under straps, was worked out. This method has been

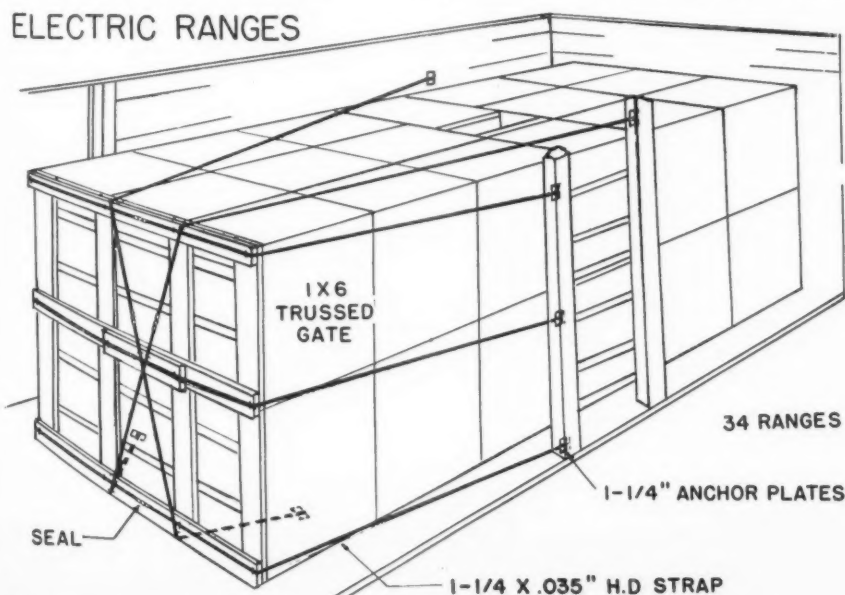


Photo of a section of Test 4, Run 5, showing container failure near roof of the car. This was corrected.

published as a recommended procedure by the Carloading Division of the National Safe Transit Committee. Later, check tests were made on 100

carloads of ranges as they arrived at destinations ranging in distance from a few hundred miles to more than two thousand miles (see photo next page.)

ELECTRIC RANGES



Before the last row of ranges is loaded, two 1 1/4" x .035" straps, wrapped to anchor plates, are fastened to the car floor so positioned that when tensioned in place, the straps will cross the center of the gate. Strapping of the same weight is fastened to anchor plates at top, middle and bottom of car slides, and brought across the front of the gate. These longitudinal straps are tensioned and sealed first, the diagonal straps last. The diagonal straps remove the bow from the gate and prevent the center row of crates from moving forward upon impact.

→ from Page 69

that field engineers must work in customers' plants until a solution is found. Because these men are specially trained in packaging and shipping methods, have years of experience to guide them, and have access to many volumes of clinical research records, their services are eagerly sought. Frequently, after preliminary study, field engineers are able to arrive at the right solution with speed and accuracy.

The test track as a laboratory testing device

Even these well informed field engineers are sometimes baffled by a stubborn problem. In such cases, they take it to a packaging and shipping laboratory for more detailed and controlled clinical research. Among other essential testing devices they use is a full scale railroad test track, fitted with standard rail cars designed specifically for exploring correct carloading methods. With such facilities, it is possible to serve industry and railroads effectively in a never-ending search for proper carloading and packaging methods. Obviously, with observations made carefully under laboratory control conditions, and with a large library of case histories instantly available for consultation, the right answers are more easily obtained. Interestingly enough, test track research in many instances has revealed, among other things, reasons for package failures as well

as those in loading and bracing. For example, packaged products individually tested and approved in laboratories or in the manufacturer's plant have sometimes not held up under full scale loading conditions. Such

Editor's Note:

Many of the principles so clearly illustrated in this article by Mr. Perry have been published in a booklet on methods recommended by the National Safe Transit Committee for loading, bracing, blocking and unloading home appliances.

Mr. Perry's article plainly indicates that to get maximum benefit from the National Safe Transit Program, manufacturers must give their attention both to pre-shipment testing of the packaged product and to proper carloading and bracing methods.

information passed along makes industry's research and testing program pay off for everybody.

Many types of loads tested

Test track experiences, as well as those of packaging and shipping research engineers of suppliers, laboratories and manufacturers, show conclusively that many factors must be considered before any method of car bracing can be said to be the "best". They include the size, shape, elasticity, rigidity and weight of individual units, as well as of the whole load; the type of container; weight and type of dunnage; size of strapping used; and height of load in the car.

The loading methods used to determine maximum degree of protection for any type of lading usually include floating, controlled floating, or wall-anchored loads.

Basic principles established

In addition to finding the answers to specific loading and bracing problems, test track research is responsible for finding and proving basic principles for application to loading and bracing many other types of commodities, or proves the correctness of established methods. Such research provides industry with practical, tested, information which aids shippers and railroads in reducing loss and damage.

It should now be of considerable interest to the reader to see how the application of basic principles discovered on the test track has helped well known firms in finding the right answers to their problems.

Case histories

Before presenting individual case histories of tests made on the test track, we want to clear up several points which might lead to confused thinking about these tests. First, all tests are made with the cooperation of the companies whose products are used in the tests. Second, in many instances representatives of container manufacturers are called in to make personal observations, and check containers for possible improvements. Third, test track results are at no time considered as final, but followed with in-transit checks and destination reports supported by photographic evidence. One more thing . . . factors in each case history vary. As a result, no reliable hard and fast rule can be worked out for loading similar commodities in other plants. Definite, basic principles are developed which, upon being applied by competent personnel, do provide a means of working out similar situations.

Photo of Test 3, Run 5, shows no damage whatever after 9 mph impact. 100 carloads were shipped (using the strapping pattern shown on preceding page) to points ranging in distance from Binghamton, N.Y., to Los Angeles. Receiving reports justified continued use of this method of loading and strapping.



The WATKINS CONTAINER



Quickly Assembled STRONGER LIGHTER

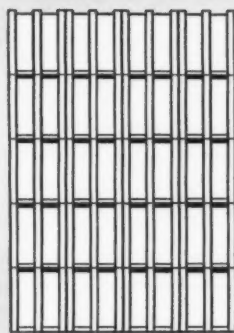
Light in weight, the Watkins Container is quickly and easily assembled to completely enclose your finished product, saving labor . . . saving time . . . saving expense. The container arrives at your plant 75% assembled.

Scientific design affords strength out of proportion to container weight: strength to carry your product safely . . . strength for stacking to any practical height . . . strength to resist weaving and shock without distortion.

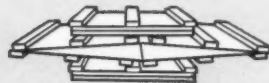
You get complete product protection: protection from outside dirt and dust . . . protection inside for fine product finishes — smooth interior with no staples or rough surfaces to damage the product.

Add to these advantages the "Traveling Billboard" feature (advertising can be printed in two colors on four sides) and you will see why more and more appliances and other valuable finished products are being shipped the "Watkins way".

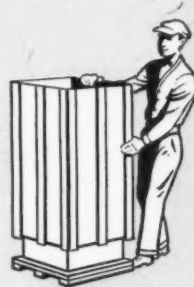
THERE IS A
**WATKINS
CONTAINER**
MADE NEAR YOU



STACKING Vertical wood cleats provide exceptional supporting strength to carry heavy loads. Typical crate supports 4 tons.



STORING Containers are delivered flat (only 3 sections) and closely nested to conserve storage space.



QUICK Assembly line packing is speeded up. Easy to handle. Complete protection for your product.

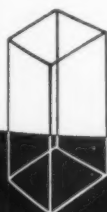


STRONG All wood cleats securely glued to tube-mat. Laboratory tests prove glued cleats resist weave and distortion better.

These companies build WATKINS containers

CORNELL WOOD PRODUCTS CO., Hummel & Downing Division, 1514 E. Thomas Ave, Milwaukee, Wis.
COZIER CONTAINER CORP. 446 East 131st Street, Cleveland, Ohio
CRATE-RITE MFG. CORP., Division of Pacific Ports Ind. Inc., 10901 Russet Street, Oakland, California
DURA-CRATES, INC. 940 East Michigan Street, Indianapolis, Indiana
GENERAL BOX CO., 500 N. Dearborn St., Chicago, Illinois, and 16th and Maple Sts., Louisville, Kentucky
HEMB & MARTIN MFG. CO. Watseka, Illinois
ILLINOIS BOX & CRATE CO. 811 Center Street, Plainfield, Illinois
KIECKHEFER BOX & LUMBER CO. 1715 West Canal Street, Milwaukee, Wisconsin
LANE CONTAINER CORP. 10212 Denton Road, Dallas, Texas
LEWISBURG CONTAINER CO. 243 Singer Street, Lewisburg, Ohio
LOVE MFG., INC. 608 South Commerce Street, Wichita, Kansas

—an inquiry to any of these companies will get prompt attention—



The WATKINS CONTAINER Manufacturers

A new approach to training packaging personnel

by Col. S. W. McIlwain • COMMANDING OFFICER, THE ROSSFORD ORDNANCE DEPOT
TOLEDO, OHIO

EARLY in World War II, reports from overseas theaters indicated that a large percentage of war materiel was being received in the several theaters in an unserviceable condition.

With the cooperation of the Forest Products Laboratory and the several branches of the Armed Forces, a conference was held on May 11, 1942, at the Laboratory covering "Procedures and Training in Packaging and Identification of Ordnance Field Service Materiel."

It was decided that a school would be started at Forest Products Laboratory of one week's duration. The first course was held June 1-5, 1942.

These packaging courses became a regular activity at the Laboratory and many hundreds of people, representing the military and industry, attended these weekly courses and it wasn't long before everyone concerned with packaging was speaking the same language.

Then the new packaging and packing specification was issued, known as U.S. Army Specification No. 100-14A or U.S. Navy Specification 39-P-16A, which became the "packaging bible". It contained not too much information on cleaning, preservation, and interior packaging.

After 100-14A was in existence for a while, we augmented that specification with M-406 which covered cleaning, preservation, and the methods I, IA, and II. That specification was really worthwhile. Even today we are using the basic information therefrom in the form of JAN's and MIL's.

Packaging and packing kept improving and before too long good packaging became the rule rather than the exception. . . .

After World War II the military

continued to procure material from industry, but it seems that commercial packaging and packing was accepted on shipments to the depots. As the turnover of this material was not rapid it was learned that deterioration was setting in.

On November 3, 1943, the Chief of Ordnance addressed a letter to the Automotive Manufacturers Association requesting assistance in the development of recommendations to serve as a basis for a course of training in preservation, packaging, and packing. Soon a group of task committees from among the Association and Ordnance personnel were named and given assignments to develop recommendations for courses on the various phases of packaging. It wasn't long until these specialists, working in conjunction with Forest Products Laboratory personnel, had developed recommendations based on existing military packaging specifications as well as on the latest techniques developed by industry. These recommendations covered the following subjects: cleaning, preservation, unit packaging, final packing, identification, inspection, control, and materials.

These recommendations were then presented to the Forest Products Laboratory for incorporation in lectures to be used in the Ordnance Packaging Training Course.

Although the course was originally designed to train Ordnance personnel in an effort to reduce the backlog of parts and equipment which required re-processing, it was intended that the benefits would be made available to other military services and industry to the maximum feasible extent.

As a result of the study by the task committee, it was decided that a model packaging line should be

established at Rossford to serve as a vital training agency. Using the wide range of knowledge available to members of the task committees, it was possible to select the most modern equipment and to design arrangements for greatest efficiency.

Establish model packaging line at Rossford Depot

By February, 1950, all plans were completed for the establishment of the model packaging line and the Chief of Ordnance gave the "green light" for the purchase of the equipment recommended by the task committee. Well in excess of \$100,000 worth of packaging equipment was procured and installed at Rossford. This included such specialized items as a complete conveyor system, power and gravity roller, as well as slat and mesh belt units, a monorail system with hoist, special agitator dip tank for cleaning and preserving, infra-red drying ovens, and automatic spraying and drying machine for applying of preservative liquids, honing cabinets, special wrapping tables and posture chairs, specially designed heat sealers, the latest in identification equipment, etc.

On October 2, 1950, the Ordnance Packaging Training Course was officially opened. This also marked the beginning of training sessions in the Ordnance Packaging Training Course. Fifty-three persons were enrolled in this first class with various services of the Army, Navy, the Air Forces, and AMA representatives being in attendance. The course itself is of two weeks' duration with half of the time being devoted to classroom lectures, demonstrations, movies, etc., while the other half is devoted to on-the-job training on the model line.

Each trainee attending the course

is presented with an adequate set of applicable packaging specifications, a sample kit of the various preservatives and solvents used, and a sample booklet containing the various types of wrapping and cushioning materials used. The course emphasizes the use and interpretation of military specifications and much time is spent in developing skill in handling specifications.

At the present time the course is being given to persons on the foreman or supervisory level engaged in packaging and inspection of packaging activities. It is the aim of the course to enable these persons to do a better job on their present assignments and also to provide a large reservoir of persons having a general knowledge and skill in packaging, who will speak the same language.

A small but adequate laboratory is available at Rossford and is used in connection with the training activity to show methods of conducting tests on packaging materials, results of various weather conditions, etc.

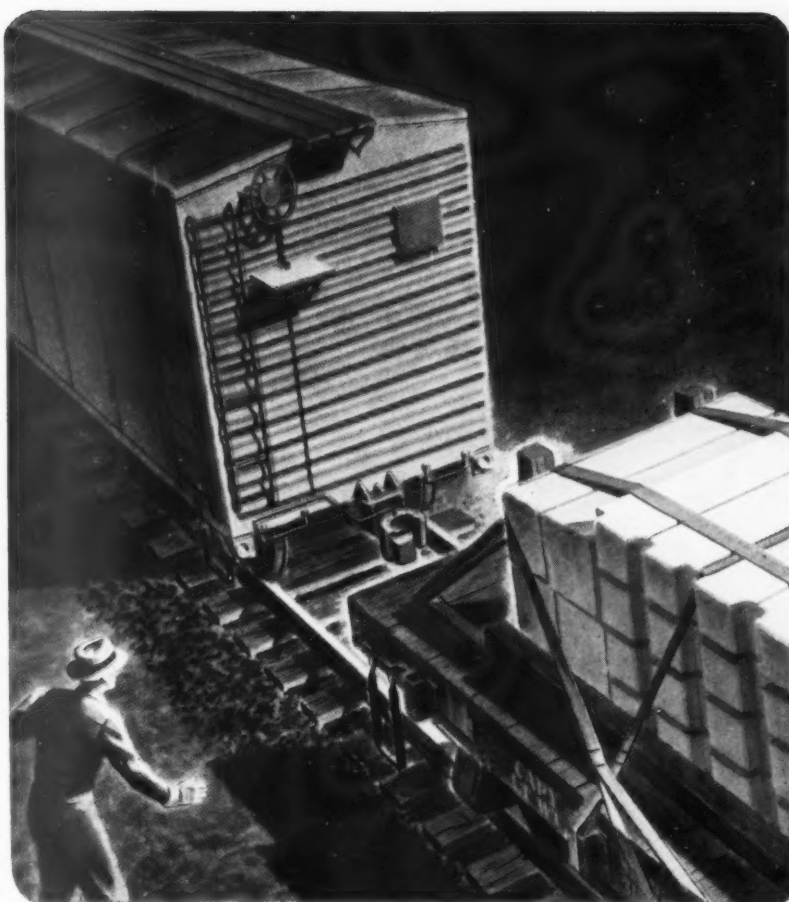
Personnel of the Association of American Railroads are assisting us in presenting a closely related subject, namely carloading, blocking, and bracing which is given on the last day of the course. On January 8, of this year, we began instructing two classes simultaneously and on a continuing basis. During this period we trained persons from the Department of Defense Agencies and industry, as well as approximately 800 men and women from the military services, industry, and Canada.

Because of the heavy demand for this training, plans are presently being carried out to increase our facilities in order to make this training available to more people.

Judging from the number of inquiries on packaging received daily at Rossford, we notice a greater interest on the part of suppliers to perform packaging requirements more accurately. We can add that results are also apparent on shipments received at our depot. A start has been made—much remains to be done.

Adapted for finish from an address before the Packaging Conference of the American Management Association, at Atlantic City, N.J., April 19, 1951.

finish JUNE • 1951



CRASH AHEAD! . . . ON AMERICA'S SHORTEST RAILROAD

Imagine a railroad crew that purposely sets up a crash between two loaded freight cars! That's what's happening in the scene above, and it goes on all the time—for this is Signode's famed outdoor test track.

The big idea behind this activity is to find out . . . under operating conditions . . . exactly what happens to your shipments in transit; what causes product damage; and what to do about it.

Research is the heart of Signode

as evidenced by this type of full-scale laboratory equipment. To more than 30,000 shippers, Signode's leadership in the development of better ways to make steel strapping . . . and to use it . . . has meant millions of dollars saved.

If you are engaged in defense or essential civilian production, it will be to your advantage to get the whole story. For now, if ever, the best use of men and materials, the quickest, surest way of distributing goods, is the first order of the day.

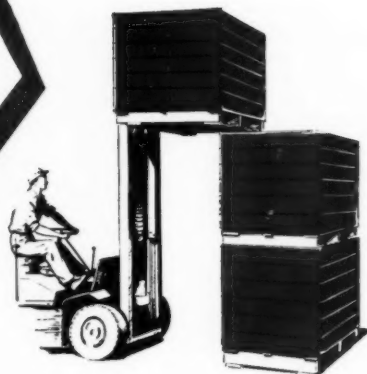
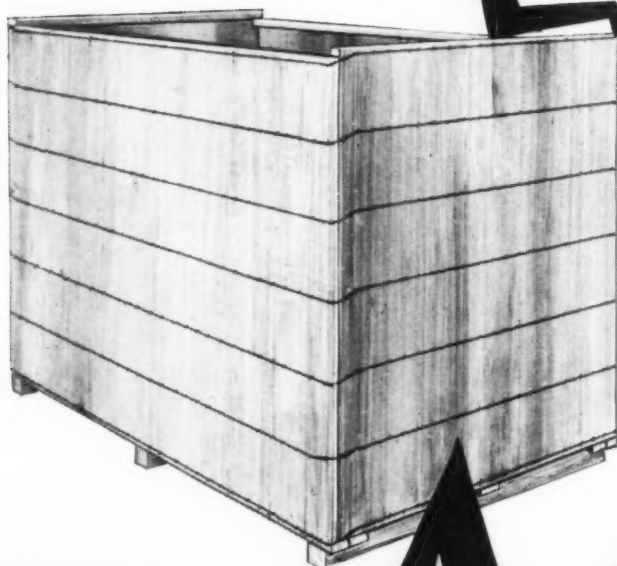
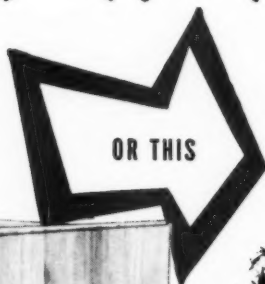
SIGNODE STEEL STRAPPING COMPANY
2639 N. WESTERN AVENUE CHICAGO 47, ILLINOIS

this seal



means security in shipping

Offices coast to coast;
In Canada: Canadian Steel Strapping Co., Ltd.,
Foreign subsidiaries and distributors world wide



Generalift

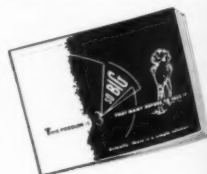
pallet boxes

- 1 CUT MATERIALS HANDLING COSTS
- 2 SHARPLY REDUCE STORAGE COSTS

More and more cost-minded manufacturers—the country over—are saving with Generalift Pallet Boxes. These versatile containers sharply reduce costs wherever materials are handled or stored. Remember, Generalift Pallet Boxes and fork-lift truck do the work of many employees. And remember also to write us for complete information. Why not do it NOW?

WE WILL MAIL FREE COPY OF "THE GENERAL BOX"

This colorful booklet illustrates and describes the many advantages of the Generalift Pallet Box. We will be glad to mail upon request.



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ENGINEERED SHIPPING CONTAINERS

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General
Wirebound
Crate



General
Nailed
Box



General
Corrugated
Box



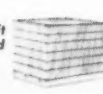
General
Cleated
Corrugated
Container



General
All-Bound
Box



Generalift
Pallet and
Pallet
Box



General
Watkins-
Type
Box



Materials handling exposition and conference held in Chicago

AN estimated \$10,000,000 in new models of materials handling equipment was displayed at the 4th National Materials Handling Exposition, held at the International Amphitheatre, Chicago, April 30 through May 4. Approximately 240 companies displayed thousands of new models in exhibits spread over eight acres. For the first time, an exhibit area was maintained outdoors to provide space for demonstrations of handling machinery for bulk materials, and to provide room for demonstration of lift trucks and conveyors in action.

The exposition, last held in Philadelphia two and one-half years ago, was sponsored by the Material Handling Institute. Concurrent with the big show, the American Material Handling Society sponsored a conference at which some 60 nationally known experts lead discussions on handling problems, a non-productive phase of industry which is said to account for more than 25% of factory payrolls. Seventeen chapters of

the society sponsored individual sections of the conference program.

Nine billions spent in 1950 for materials handling

The conference keynote address was delivered by Allen K. Strong, general chairman of the conference.

"American industry spent over nine billion dollars last year, just to move its products from one place to another, raw materials to the plants, materials during manufacture, and finished goods to the stores.

"If all of these moves had been made with the modern equipment and methods familiar to any qualified materials handling engineer, at least two billion out of the nine billion dollars could have been saved. Nearly one million workmen would have been released for more useful production," stated Strong, who is also with the materials handling section of American Cyanamid Co., New York City.

Six reasons for proper materials handling

In his address before one session,

K. W. Frase, project engineer, P. W. Voss & Associates, Chicago, mentioned six reasons why proper materials handling should be used by industry.

"First, *time is money in the bank*. Flow of materials accounts for the largest single factor cost in your operation. Obviously, it's money in the bank if you save time. And saving time is just what mechanical handling does. It takes less time to unload . . . less time to move . . . less time to stack . . . less time to take inventory . . . and less time to load.

"Next, *consider the space problem*. If you want another warehouse—free—think of cubic feet. Mechanical handling often can give it to you by using space you now throw away.

"Number three, *keep materials mobile*. Use pallets, unit loads, fork trucks, hoists, cranes. Move tons instead of pounds at a fraction of the cost in time and labor. Meet any demand at any hour.

"Four, *lower shipping costs*. Labor and freight costs are still rising. They

Photo shows only a small portion of display of materials handling equipment at the International Amphitheatre.



make mechanical handling a must. Because merchandise is handled less often mechanically than manually, shipping damage is reduced.

"Five, *labor relations is a big point*. We have passed the days when men should be called on to do back-breaking, health-destroying jobs that can be done by machines.

Six, *accidents can be decreased* by reducing fatigue and strain.

The big issue of

inter-plant movements

"Now for the big issue . . . inter-plant movements. Right now, these are so far from being modern that it's a major economic tragedy. The obsolete methods we employ to ship things from one plant to another cost the nation so much money that I for one can't imagine it.

"And strangely enough," Frase told his audience of materials handling men, "only *three things* stand between us and universal unit load handling for inter-plant shipments as well as for use inside of plants . . . and I urge you as representatives of

many industries to use all your knowledge, ability and strength to see that we accomplish these three big points:

"(1) Lower freight rates for shipments of pallets, both loaded and empty, (2) pallet pools available to all shippers at a rate they can afford, and (3) standardization of carrier equipment to accommodate unit load handling."

Loss and damage claims

"Freight loss and damage claims paid by the U. S. railroads for the two 10-year periods ending with 1933 and 1943 averaged, respectively, \$32,027,000 and \$23,007,000 per annum," stated A. L. Green, special representative, Freight Claim Division, Association of American Railroads, Chicago.

"In the year 1941, when the prevention effort quite likely was at a peak of effectiveness, the claim payment cost 48 cents of each \$100 of gross freight earnings. In the two decades selected, the ratio of claim expense to revenue ranged from .48 to 1.06%, but mostly stayed below

.80. These figures are presented to contrast the marked difference between peacetime and wartime damage hazards. As an aftermath of World War I, the railroads paid \$119,833,000 for the year 1920 in settlement of loss and damage claims which took \$2.78 from each \$100 of gross freight revenue; and for the year 1948, an all-time high of \$130,656,000 was paid for loss and damage claims, but this took only \$1.61 of each \$100 of freight revenue compared with a top ratio of \$2.78 in 1920.

"Since 1943, the claim expense has come down to \$84,802,300 for 1950, a reduction of 35.1%, and the 1950 ratio to earnings was 1.08%. But now again war conditions are reversing the down trend, and 1951 is likely to see a sizeable increase in the claim account . . .

"Although freight loss and damage claims payments since 1943 have been reduced by \$46,434,000, no one connected with the railroads—much less a prevention man—could be even half-way contented with a condition that is still wasting close to \$100,000,000 a year . . .

Checking the current rise

in claim expense

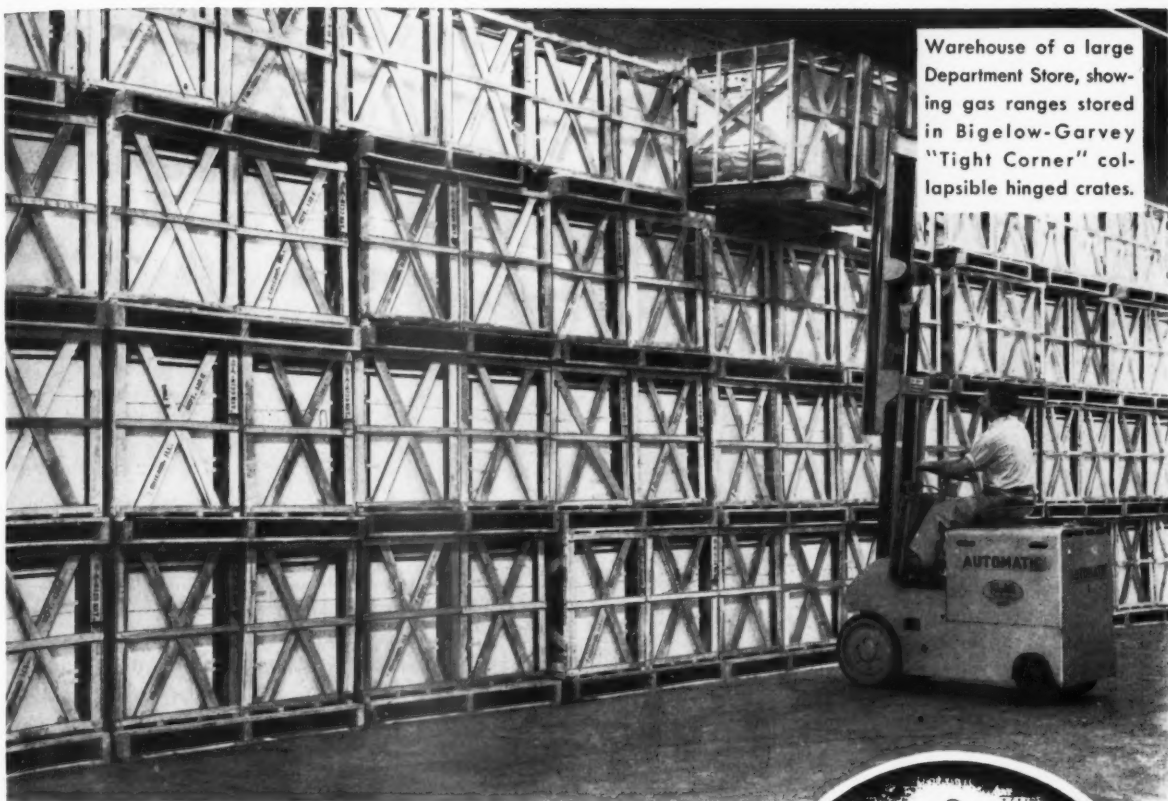
"The car-building program, the intensified claim-prevention work being carried on by the special prevention departments of the individual railroads, in the Association of American Railroads, and by shippers individually, and through trade associations, and the Shippers Advisory Boards will go a long way, it is hoped, toward holding in check the current rise in the claim expense.

A tribute to packaging, materials handling engineers

"A very potent force in the vastly improved packaging and handling techniques are the packaging and material handling engineers, and the package designers employed by box makers. This gives me an opportunity to pay tribute to this comparatively new profession, which has been of such great assistance to the railroads in providing trouble-free transportation. There is just one suggestion I would like to offer, and that is the responsibility for packaging and load-

Materials handling progress—is illustrated by this photo showing a modern industrial lift truck compared to a lift truck built in 1887. This new 1951 truck can hoist 4000 pounds 10 feet up in the air for stacking and storage.





STRENGTH

for **STACKING ... for HANDLING**

There is **STRENGTH** in the Bigelow-Garvey "Tight Corner" collapsible crate—strength to handle all normal transportation and handling hazards—strength for stacking to all normal heights for storage.

Bigelow-Garvey crates are engineered for your particular product, built of the finest crating materials and accurately manufactured in all details.

The "Tight Corner" hinged crates offer rigidity, strength, lightness and ease of assembly not found in ordinary crates. This is due to the fact that they are 65% assembled. (Only 3 parts—top, bottom, and collapsible tube.) Labor for assembly in your plant consists of nailing top and bottom in position. (Nail holes are pre-drilled as a time saver.)

We will welcome the opportunity to help you find the right answer to your shipping problems, whether they pertain to civilian goods or to equipment and supplies for defense. Write us *now* and you can soon begin to save money and reduce shipping losses.

Write us regarding your shipping problems

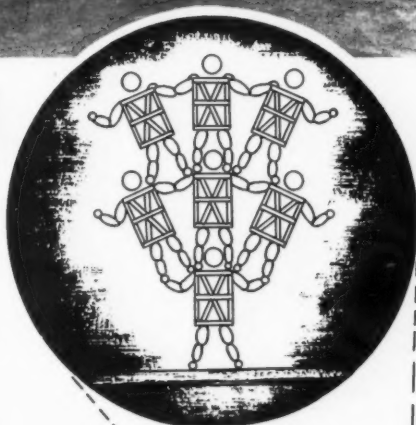
BIGELOW-GARVEY LUMBER CO.

General Office and Laboratory

320 West Huron Street, Chicago 10, ILL.

MILLS: ARKANSAS GEORGIA WISCONSIN MINNESOTA ILLINOIS

finish JUNE • 1951



Manufacturers of ranges and all types of home appliances are turning to the "Tight Corner" collapsible crate for assurance of safe delivery of their finished products.



50 YEARS OF BETTER BOXES—"THE American WAY"



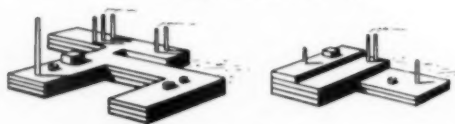
Here's Super-Protection for Shipping Your Sanitary Ware and Appliances!

You can't count your profits until your products are delivered—*intact, undamaged!* That's why American box engineers and technicians have devoted half a century to the development of improved boxes and crates which do a *better job* for you, at *lower cost*.

Today, you are getting the accumulated benefits of those 50 years of progress in every American shipping container you use. You get *extra protection* for fine finishes—you get *extra support* for resisting shocks and stresses. You get the all 'round *best* that money can buy—for *less*, thanks to economies of American's modern manufacturing efficiency. Are you getting the most for your shipping dollar? Check with American today—and see for yourself.

TWO GREAT PLANTS (Est. 1901)

Centrally located in Cleveland, Ohio, and Marion, South Carolina; featuring most complete modern facilities for serving American industry.

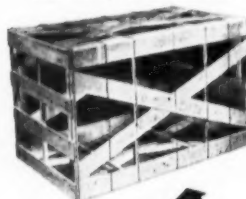


THE American BOX CO.

1902 W. 3RD ST.
CLEVELAND 13, OHIO

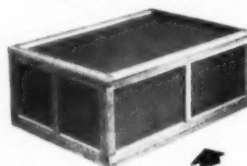
MARION,
SOUTH CAROLINA

Porcelain ware packed in American Wirebound Crates save money for this customer.



WIREBOUND CRATE

Strength-tested, lightweight. Built-in support features. Easy handling, stacks well. Supplied flat for wrap-around assembly.



FIBREBOARD BOX

Attractive, low-cost. Fully enclosed, panels steel stapled to wood cleats. Superior reinforcements. Supplied flat for easy assembly.



NAILED WOOD BOX

Materials and workmanship to meet or surpass Government Specifications for domestic or export shipments.

ing should not be divided responsibility, but should be vested in a single person," stated Green.

Wider use of handling equipment can up industrial capacity 10%

A minimum increase of 10% in America's industrial capacity can be achieved through wider and more thorough use of modern materials handling equipment, it was forecast during the exposition by Elmer F. Twyman, vice president in charge of Yale & Towne Mfg. Co.'s Philadelphia division.

keeping abreast of Safe Transit developments in South Africa

To NST Committee:

We thank you for your recent letter and for the kit on Safe Transit information.

The South African Bureau of Standards has informed us of their co-operative arrangement with your Committee, and we have put the Bureau into touch with our customers who are interested in improving packing methods.

We, and most of our customers, subscribe to *finish* magazine, and will be kept abreast of developments in your Safe Transit Programme by this publication, and by releases to be made by the South African Bureau of Standards.

We appreciate that the conditions of transit in South Africa may make your test procedures not directly applicable as norms for use here, but we have no doubt that the South African Bureau of Standards will devise norms applicable to local conditions.

We thank you for putting us into touch with makers of your approved test apparatus, which is being used by the South African Bureau of Standards also.

Your assistance and offer of additional information is greatly appreciated, and we shall avail ourselves of your facilities should occasion arise.

D. Kenealy
Managing Director
Ferro Enamels (Proprietary) Ltd.
Johannesburg, South Africa

Packaging exposition and conference

including reports on the outlook for packaging materials

THE annual National Packaging Exposition and Conference held in Atlantic City's Auditorium, April 17-20, was one of the most successful in the 20-year history of the show, according to a spokesman for the American Management Association which sponsors the annual event.

Final attendance at the Exposition was 15,443, with more than 1,100 persons attending the Conference sessions. Exhibitors numbered 261, as against 242 exhibitors at last year's show held at Chicago's Navy Pier, with this year's show covering 19 per cent more floor space. The 1951 attendance was up 4,000 over the 1949 show, also held in Atlantic City.

The Conference on packaging, packing and shipping problems for both military and civilian products, was very well attended at all sessions.

Reducing shipping damage

At one session, A. M. Underhill, packaging engineer and superintendent of shipping, General Electric's Meter & Instrument Division, West Lynne, Mass., discussed "Reducing Product Damage through Better Shipping Protection."

Referring to "a recent case of a new medium size transformer weighing only 30 pounds," Underhill stated that "after some study, it was decided to pack in a similar manner as other transformers of the same design. In a drop test, the core was practically torn from the angle iron base in the floating pack used. Study revealed that it was very unbalanced, with the center of gravity three-fourths of the distance up from the base, and that a shock of 200 G's was all it would stand. Consultation with the design engineer resulted in strengthening the transformer at its weak point at relatively little cost and allowed us to use our first packing choice, thus avoiding a much more expensive

packing. In many cases, slight engineering changes of the product will do much to help with the packing, and sometimes will avoid an expensive packing cost.

"By the proper application of the available knowledge of all kinds of packaging and packing materials, not only is product damage reduced, but in most instances an actual cost reduction results.

Pack size reduced 27%, with weight reduced 30%

"Years ago," continued Underhill, "we developed under the old cut-and-try method a pack-up for an extremely delicate piece of apparatus which consisted of a protective wrap and inner box, 3 inches of shredded parchment on all sides in an intermediate box, and then packed two to a container in 3 inches of parchment in a large box. The final result was a pack weighing about 12 times the weight of the unit. Most of this over-packing was done to reduce rough handling because the gross weight and size was too great for one man to handle, except with a two-wheel hand truck.

"In the light of present day knowledge, we were able to reduce this package as follows and protect it even better than before. The package now consists of an inner container used only to give us uniform bearing surface and protect projections on the unit with purchased pads of the correct density and thickness in an intermediate container. This new package can be used with no further packing as a shipping container. But to reduce the number of pieces to handle, we bulk-pack four to a carton. The reduction in size over the old pack is about 27%, and the weight has been reduced by 30%. While we are using plenty of caution markings on the outer box, we are not so con-

cerned about normal rough handling."

Designing the package as part of the product

Charles D. Mattingly, packaging engineer, The Coleman Company, Inc., Wichita, Kansas, discussed "Designing the Package as Part of the Product" before a Conference session. In his address the speaker explained how his company uses *analytical packaging engineering* and pre-shipment testing to uncover many unnecessary packaging costs (see "Pre-Proving Pays," by Mr. Mattingly, March 1951 finish). He then presented a number of "case histories," a few of which follow:

"In one of our first studies," said Mattingly, "we discovered a case where two pads, valued at three cents each, were in the package setup, although their original use and intended purpose had long been obsoleted by design changes in the product. Purchasing still had them on their bill of material, and the packers not knowing what to do with them merely dropped them inside the package. In high production these three-cent pads were quickly amounting to considerable negligent waste. . .

"We saved two cents each on a draft meter package by changing to a 125 lb. test corrugated box instead of a 200 lb. test box. The more expensive box was obviously not necessary since these draft meters were only shipped inside a crated furnace. Though only a slight detail, one production run of 20,000 furnaces saved us \$400. . . .

"One simple instance of reduction in a product's manufacturing cost was created by the adoption of an improved method of securing the crate base on a space heater, which allowed the elimination of four expensive clinch nuts and bolts. . . . ➔

"Lately, where possible, we have been using automatic glue machines and quite a few automatic stapling devices. Our present records show that the adoption of these faster sealing methods are amounting to savings in sealing material and labor of over \$25 per day. . . ."

"A good example of reduction in materials handling cost is had in the transfer of floor furnace registers from the paint room through stock to the assembly line. Between each register we use a waxed top pad to serve the dual purpose of protecting the register finish during the transfer operation, as well as re-use in the final package. . . ."

The packaging material picture

Kenvon Loomis, industry consultant, Adhesives Manufacturers Association of America, New York City, in discussing the general picture on

adhesives, told the packaging men attending the Conference sessions that "if the world tension diminishes this summer, and the recent tendency to reduce inventories continues, the supply of adhesives will be adequate, except possibly in the case of resin emulsion adhesives; on the other hand, if world tension increases this summer and requires a step-up in our military program, there may be temporary instances of short supply of certain types of adhesives. However, in the case of an all-out war, a priority program of some type will probably be set up, by which the basic essentiality of both the adhesive and packaging industries should result in both industries getting a sufficiently high priority to maintain normal production schedules, both military and civilian."

Regarding strapping material, R. A. Norris, of NPA's Container and

Packaging Division, stated "The steel strapping industry contributes probably more in the overall conservation of packaging materials than any other one consumer of steel. Steel strapping has a multitude of uses by the military, with the military "take" somewhere in the neighborhood of 40% of the production, and with steel availability in many instances based on peacetime periods it is simple to deduce that this industry needs added steel by the thousands of tons during this emergency."

The wood picture was given by Nathan Tufts, director, National Wooden Box Association, and also vice president and general manager, New England Box Company. Tufts concluded that "it can be freely stated that the future is more hopeful . . . Inventories have begun to improve, uses are approaching a point of balance, labor is happier, and as always happens, the law of supply and demand is levelling off price differences. In my opinion, these natural events will better correct the shortages that have existed, than will the use of substitutes or a switch to illogical packages, because the container field in its diversified production has seemed to share equally in the burdens of the problems we have been discussing. No one package has seemed capable of a better than usual price position."

The military aspect

One Conference session was devoted entirely to an open forum on military packaging requirements with men from the various military organizations participating. The forum was preceded by a talk on "The Objectives of the Munitions Board in the Program of Military Packaging" by Col. John A. Way, USAF, Chief, Munitions Board Packaging Division, Office of Procurement Methods, Washington, D. C. (see "Munitions Board Packaging Committee Meets," Page 70, November 1950 finish).

At another session, Col. S. W. McIlwain, Commanding Officer, The Rossford Ordnance Depot, Toledo, Ohio, discussed in detail a new training program for packaging engineers set up at the Rossford Depot (see page 74).



ATA SHIPPER-CARRIER-RECEIVER MEETING, JUNE 20, TO FEATURE SAFE TRANSIT PROGRAM

At the annual Shipper-Carrier-Receiver Meeting of the American Trucking Associations, June 20, the National Safe Transit Program will be the feature subject of the afternoon program. This meeting is a part of the ATA National Freight Claim Council's annual membership meeting to be held at Fort Shelby Hotel, Detroit, Michigan, June 19-22.

ATA reports that "invitation is extended to all shipper-receiver organizations and to all interested shippers and others to attend this meeting. Likewise, package engineers and others are invited to attend the demonstrations on package testing equipment."

The program for June 20 follows:

9:00 a.m.—Registration

9:30 a.m.—Shipper-Carrier-Receiver "Claim Progress" Meeting—This Meeting consists of a round-table discussion.

Shipper-receiver representatives will be given an opportunity to tell the carrier representatives just what is wrong with carrier claim handling, service and prevention, and to suggest steps for improvement. The carrier representatives in turn will have their say in telling the shippers how they can help the carriers do a better job.

12:30 p.m.—Shipper-Carrier-Receiver Luncheon—Speaker: A. W. Schwietert, general chairman, Shippers Advisory Boards; general traffic manager, Chicago Association of Commerce.

2:00 p.m.—Demonstration of Package Testing Equipment—The National Safe Transit Program—What It Is—Its Objectives—Its Accomplishments.

Dana Chase, editor of *finish*, will serve as coordinator for this section of the program, and will introduce R. F. Bisbee, NST committee general chairman, and other NST committee and sub-committee chairmen who will participate in this session. **Demonstrations:** Package Tester, Conbur Incline Testing Device, Drop Tester, and Mechanical Shock Recorder.

The American Trucking Association will then present a demonstration of other laboratory package testing equipment.

7:00 p.m.—Shipper-Carrier-Receiver Banquet—Toastmaster: Robert J. Bayer, editor of *Traffic World*; Speaker: Edward F. Lacey, executive secretary, The National Industrial Traffic League.

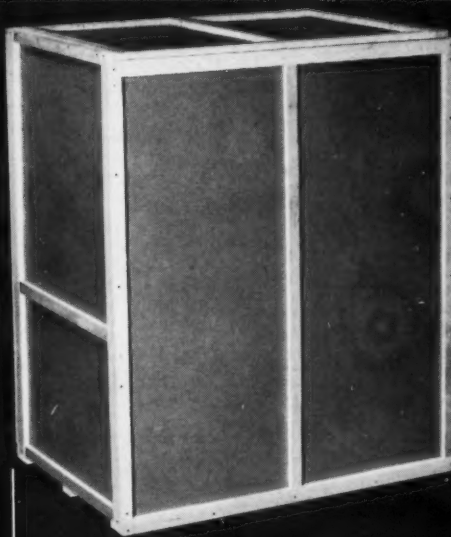
APEX, FLORENCE STOVE, MAJESTIC MFG. BOOST SAFE TRANSIT CERTIFICATION TOTAL TO 80

A total of 80 manufacturers of home appliances and allied metal products are now participating in

the National Safe Transit Program.

The latest companies to be certified include: *Holland-Rieger Div. of*

Cleated
Fibre
Shipping
Cases



FOR
Commercial
Shipments

FOR
Government
Shipments

are safe, dirt-proof, strong — light in weight — comply fully with railroad and government requirements — present a clean, attractive exterior that lends itself well to advertising your product.

Cornell Cleated Fibre Cases are made at our Hummel & Downing Division at Milwaukee in many styles and sizes. We invite your inquiries for Cleated Corrugated or Cleated Solid Fibre Cases.

They comply with Government Specifications Jan-P-103 and NN-B-591.

Cornell
HUMMEL &

WOOD PRODUCTS COMPANY

DOWNING DIVISION, MILWAUKEE 1, WIS.

SPECIALTY PAPERBOARDS, FOLDING CARTONS, CLEATED, SOLID FIBRE, AND CORRUGATED SHIPPING CONTAINERS

Apex Electrical Mfg. Co., Sandusky, Ohio; Florence Stove Co., Kankakee, Illinois; and Majestic Manufacturing Co., St. Louis, Missouri.

Further information on the NST program may be obtained by writing to the National Safe Transit Committee, 1010 Vermont Avenue, N.W., Washington 5, D. C., or to *finish* magazine.

CARLOADING, BRACING DISCUSSED AT TEMPLE U.

Management service students at Temple University recently heard a timely lecture on carloading and bracing methods by Robert L. Knapp, Philadelphia district manager, Signode Steel Strapping Co. Knapp prefaced his talk with a discussion of the importance of the steel strapping industry in the present emergency, and following his lecture conducted a question-answer forum.

NEW SIGNODE VICE PRESIDENT

J. M. Moon has been elected vice president of Signode Steel Strapping Co. As vice president, Moon will



continue in his present capacity as director of sales. He has been with the firm since 1934.

LINK-BELT BUILDING NEW PENNSYLVANIA PLANT

Link-Belt Company has announced the beginning of construction of a new engineering and manufacturing



AHLMA traffic meeting—Members of the American Home Laundry Manufacturers Association Traffic Committee met recently in Chicago to discuss problems pertinent to the industry's packaging and shipping of products. Present at the meeting were (left to right, front row): W. R. Dunn, Easy Washing Machine Co., Syracuse; J. G. Borson, chairman, Hotpoint, Inc., Chicago; R. H. Thompson, Maytag Co., Newton, Iowa; H. J. Benzie, General Electric Co.; Jack Noelke, Association secretary. Second row (left to right): E. Keene, Hotpoint, Inc.; W. E. Kasel, General Electric Co.; E. Zelinski, Hotpoint, Inc.; Dana Chase, Dana Chase Publications; and A. E. Bocher, Hamilton Mfg. Co., Two Rivers, Wis.

plant, for production of elevating, conveying, and processing machinery, on a 43-acre site at Colmar, Penn. The new plant, to contain approximately 300,000 square feet of floor space, is reportedly designed for straight-line manufacture from the receiving department at one end of an 880-foot long building to the shipping department at the other end.

Industry News

→ from Page 58

to be 16,000 units annually, but plans are to begin production at 1000 units per month. The factory boasts more than \$1,000,000 equipment, most of it shipped from the United States.

U.S.S. PRODUCTION RECORD

U.S. Steel's Gary Works, largest steel mill in the world, broke numerous production records in April for open hearth and blast furnace production.

In the open hearth department, 549,573 tons of steel were made to better the previous record established in March of this year, by almost 10,000 tons. The blast operations for April were 100 per cent and accounted for 379,381 tons of iron to

better by almost 2,000 tons the previous record established in July, 1950.

NESCO TO PUSH ROASTERS

Nesco, Inc. has announced elaborate plans for aggressive promotion of Nesco broiler-roasters in the New York metropolitan area. H. Henry Martens, eastern regional sales manager, said the program would be backed up by the most extensive advertising and sales promotion ever utilized in a single market by Nesco.

ROPER TESTING ENGINEER

Robert C. McLaughlin, George D. Roper Corp., has been named chief testing engineer, it was announced by Everett H. Shands, director of engineering and development. McLaughlin has been with the firm's inspection and test departments since 1937.

HOTPOINT ELECTS

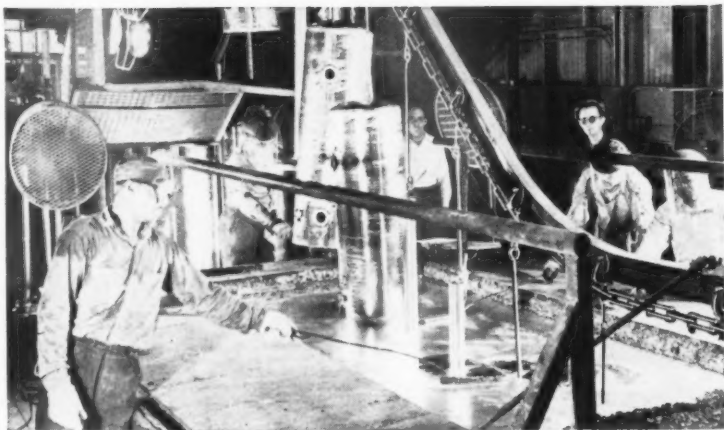
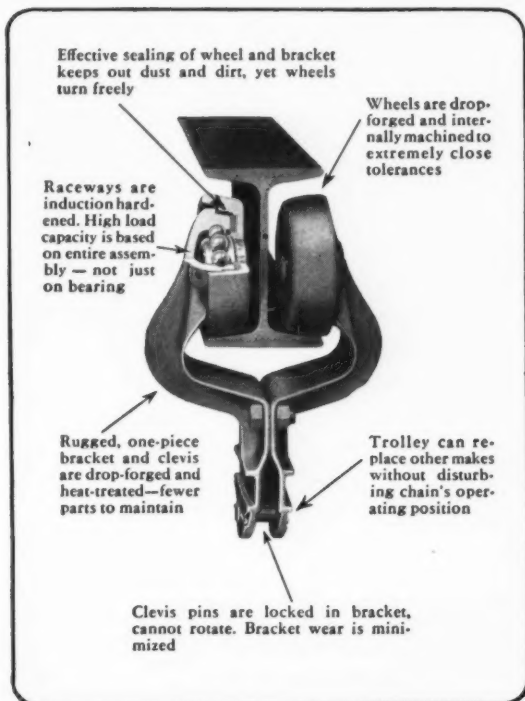
TAYLOR VICE PRES.

Edward R. Taylor, general sales manager, Hotpoint, Inc., has been elected vice president, it was announced by James J. Nance, president. Taylor will be responsible for directing all of the company's marketing policies.

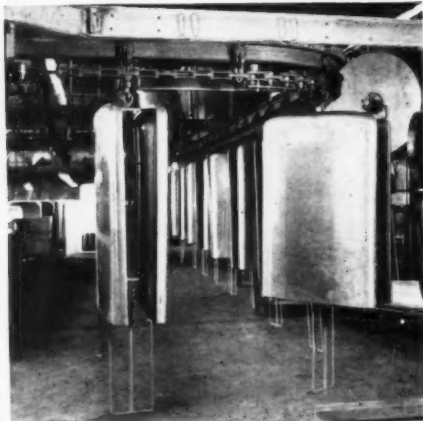
When you buy TROLLEY CONVEYORS . . .

LINK-BELT GIVES YOU BOTH!

**Superior components →
plus engineering ingenuity**



This Link-Belt Overhead Trolley Conveyor, shown carrying Rheem steel water heater tanks out of the kettle, is an integral part of a controlled automatic hot-dip galvanizing process.



Refrigerator doors are carried by a Link-Belt Overhead Trolley Conveyor from alongside the presses in steel shop through finishing.

Travel up, down and around at synchronized speeds. Straight-line production regardless of physical layout. Saving of floor space. Release of manpower for productive jobs.

You get all these outstanding production advantages with any well-engineered overhead trolley conveyor. But you get more—much more—when you specify Link-Belt.

Not only does Link-Belt make the most popular, the most advanced trolley on the market—you also tap industry's greatest source of materials handling and power transmission experience.

Put quality manufacture plus engineering ingenuity to work for you. Our specialists will work with you and your consultants . . . help you set up smooth, steady, straight-line production in your plant.

LINK-BELT

OVERHEAD TROLLEY CONVEYORS

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in principal cities.

12,345-B

NOT SO LONG AGO...



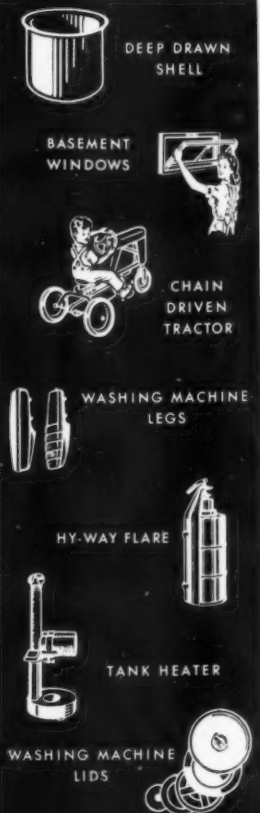
FOR ESTIMATES, SEND US BLUE-PRINTS ON YOUR DEFENSE NEEDS TODAY.

Just a few years ago, the New Monarch Machine and Stamping Company was busily engaged in producing, among other things, cartridge storage cases for use in World War II.

Today another war threatens and once again it becomes necessary that we do our bit toward the defense of this great land. Though still serving our civilian clients as well as government restrictions permit, we have time open for defense orders. It may be we can help you with your defense work.

New Monarch is particularly qualified in the fields of die making, steel stampings, welding, assembly, finishing and packing. Our three modern plants are staffed with highly specialized and experienced craftsmen. We have approximately four acres of the most modern equipment and storage space — all amply served with railway siding.

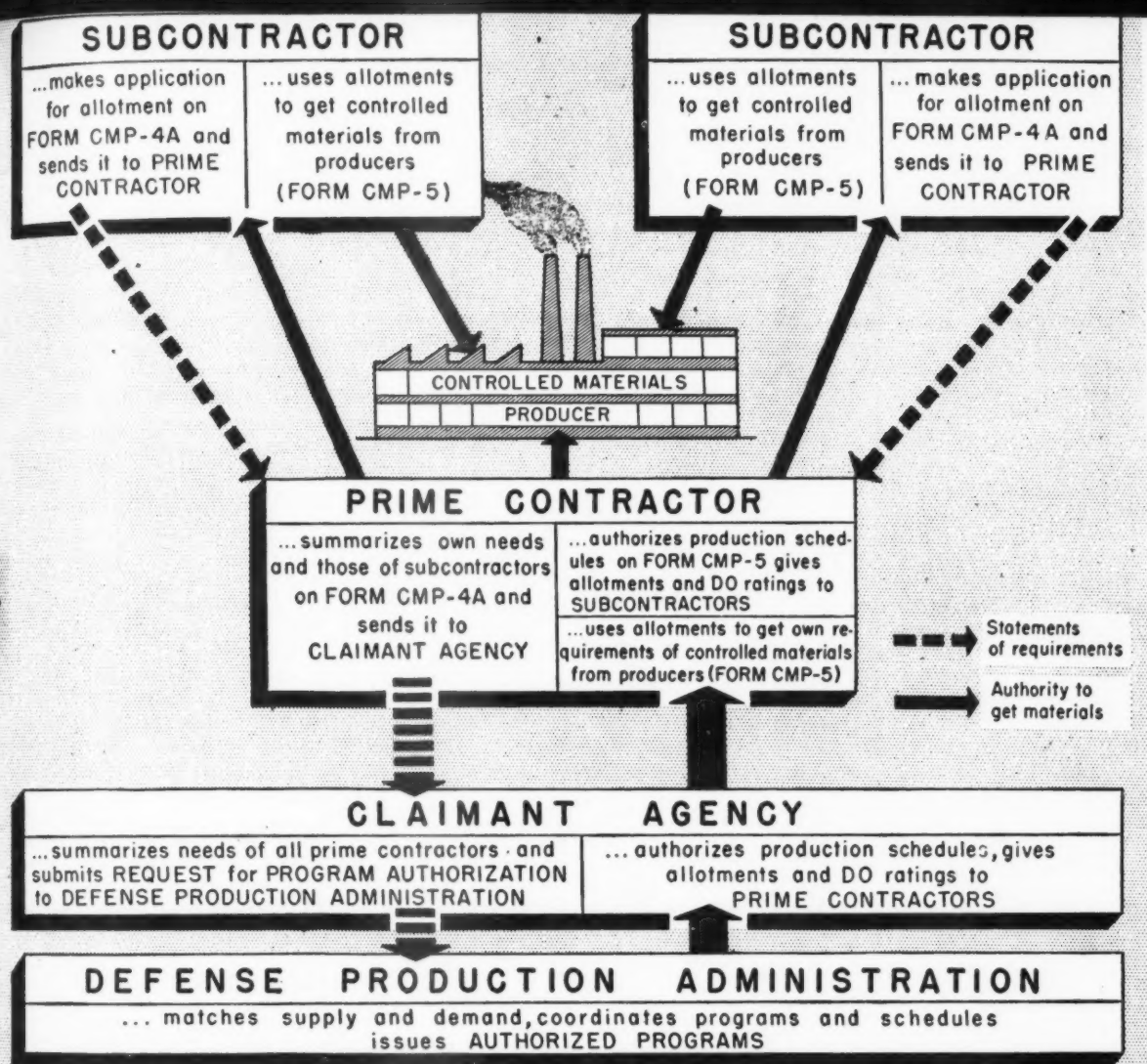
Whatever the size and scope of your defense contracts, we can assist you in completing them on time. We hope you will feel free to call on us with your stamping problems.



When you think of Stampings, think of

NEW MONARCH MACHINE & STAMPING CO.
406 S. W. NINTH STREET

DES MOINES 9, IOWA



HOW CMP WORKS FOR "A" PRODUCTS

BASIC RULES

New Regulation
NPA CMP Reg. 1

Title: Basic Rules of the Controlled Materials Plan; General

Issued: May 3, 1951

Intent: To define rights and obligations under the Controlled Material Plan.

What the Regulation Does

Explains:

1. How production schedules are authorized.

a. Claimant agencies or NPA industry divisions will authorize the production schedules of prime consumers (prime contractors). The prime consumer authorizes the production schedules of his direct secondary consumers (subcontractors).

tors). Each secondary consumer authorizes the production schedule of his own direct secondary consumers.

2. How allotments are granted and used.

a. When the production schedule of the prime consumer (including all the production schedules of his secondary consumers) is authorized, the claimant agency or industry division makes an allotment of controlled materials (steel, copper and aluminum) to him sufficient to meet this schedule. Prime consumers, in turn, make allotments to their direct secondary consumers. Each secondary consumer then makes allotments to his own secondary consumers.

b. Allotments are made on a quarterly basis in terms of one or more of the following: (1) carbon

steel; (2) alloy steel; (3) stainless steel; (4) copper and copper-base products, and brass mill products; (5) copper-wire mill products; (6) copper and copper-base alloy foundry products and powder; (7) aluminum.

c. Allotments are identified by an allotment number consisting of a claimant agency letter symbol, one digit designating the authorized program of the agency and the quarter during which the allotment is valid. Example: K-2-4Q51.

Establishes:

1. Procedures for applying for allotments of controlled materials.

a. Prime consumers manufacturing Class A products apply to the appropriate claimant agency for an authorized production schedule and

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YODER COMPANY, THE.....	55

"I saw your ad in finish"

related allotment on Form CMP-4A. Secondary consumers apply on Form CMP-4A to that company under which they hold a sub-contract.

b. Prime consumers manufacturing Class B products file applications on Form CMP-4B with the appropriate NPA industry division. (For a listing of B products, see "Official CMP Class B Product list." Products not contained in this list are considered Class A products).

2. Rules applicable to controlled material producers.

a. Sets lead times for each size and grade of controlled materials.

b. Sets the minimum quantity for each size and grade on controlled materials which a mill is required to ship any one time to any one destination.

Requires:

1. Authorized production schedules be met by a manufacturer unless special circumstances prevent his doing so.

2. Each consumer making or receiving an allotment of controlled materials to keep accurate records of all allotments received and of the subdivision of allotments among his direct secondary consumers and that each consumer retain these records for at least two years.

3. Every authorized controlled material order to show both an allotment number and the following certification "Certified under CMP Regulation 1."

4. A consumer to return excess materials if his allotment is too large; if allotment is insufficient to meet authorized schedule, he may apply to the person or agency from which he received the schedule.

5. All consumers to comply with all applicable regulations and orders of NPA.

Prohibits:

1. The use of allotments and DO ratings by a manufacturer to exceed authorized production schedules, except under special conditions.

2. A consumer from requesting delivery of any controlled material in a greater amount or on an earlier date than required to fulfill his authorized production schedule.

3. A consumer from requesting delivery of any controlled material in an amount which would result in an inventory of controlled materials beyond the limits set by regulations for those materials.

For details: NPA release 612.